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Central Oscillator and Space-Quanta-Medium

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Central Oscillator and Space-Quanta-Medium

Foundations of a new physics and a new cosmology

based on the newly discovered space-quanta-flux SQF

Foundations of a new SQM/SQF-Technology

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Part 1

The New, Unified World View of Physics

by O. Crane

1. Introduction

Since there has been no success achieved yet in explaining all physical facts and results of experiments with a universal and unified theory, the serious and absurd step away from reality into abstraction was taken. In so doing, explicitly and consciously, one gave up the idea of creating a concrete and visual picture of physical phenomena. One seems to be happy with purely mathematical proofs. Experimental facts take a secondary place and are only accepted, if they “fit” into the official doctrine. A different opinion , for example, was held by Goethe, who believed that mathematics was not at all required in order to understand natural, scientific phenomena.

It is believed, therefore, that nature can be explored according to the principle of the sorcerer’s apprentice:”If you do thus and so, then this and that will happen”, but one does not have the minutest idea of what in reality and, actually is happening. The problem of the unification of the world view of physics can not be solved on the basis of mathematical fictions. This has been proven sufficiently by now since all attempts thus far have failed. The total takeover of physics by mathematics, changed it into an abstract discipline, which conveniently overlooks the facts. Physics should not be conducted in the dragnet of mathematics alone, since it is a rather independent field, which can be described with logical, functional models. Significant for the reality of natural events can only be experimental facts, and by no means any mathematical abstractions.

Even the smallest particle possesses a certain spatial volume and thus has 3 dimensions. Up to this time there has never been shown an actual structure with more or less than 3 dimensions. Even the thought of a 4-dimensional object is an absolute impossibility, and even more so its practical realization. Inspite of this, presently , as is well known, work is being done worldwide on the theory of ”superstrings” based on 10 dimensions! (9 spatial dimensions and 1 dimension for time). Beyond this, establishment physics, however, is convinced, that nature somehow is able to create “structures” up to 26 spatial dimensions (!), for only thus can light waves be mathematically “described”. Even the greatest nonsense can be mathematically described or ‘camouflaged’ thus attaining credibility in the eyes of establishment physics.

Empty Space: Empty space is defined as an “absolute nothing”. but in an absolute nothing, nothing can change. If, however, an electromagnet is switched on inside a vacuum, then the building up of a magnetic field does cause a change in the so-called “absolute nothing”! The same thing happens when an electric field is established! Therefore, if changes in “empty” space do happen, then of necessity “something” has to be present which is changing.
Consequently “empty” space must contain a substance yet to be defined or a medium must exist (but not in the sense of the classical ether-idea).

Vacuum
A space free from any matter is described as a vacuum. This state can be artificially created with the help of a vacuum pump. Strictly speaking, a pure vacuum, however, does not exist. Even between galaxies there are found elementary particles, even if only in a minute density. A point in space, however, can very well have an electromagnetic potential. Electromagnetic radiation penetrates the vacuum at the velocity of light.

All of physics abounds with “phenomena” (unexplained facts), which establishment physics can not explain nor prove. These “phenomena” are therefore “ignored” and for obvious reasons do not find a place in textbooks or instructions in universities and higher schools of learning.

Ether is what Aristotle called the heavenly substance, which light penetrates in order to reach earth. Ether, is the Greek word for ‘shine’. Since the ether can not be differentiated from the vacuum, it can not move and thus remains at absolute rest. If there is absolute rest, there will also be absolute motion, absolute space and absolute time. The next question was, what is the absolute velocity of the earth compared to this resting ether. Such a value would be of great importance for the philosophy of science.
If light consists of ether waves, as formerly assumed, then velocity measurements of light in the direction of travel and against the

Classical Ether (Aether) Idea
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If light consists of ether waves, as formerly assumed, then velocity measurements of light in the direction of travel and against the direction of travel of the earth, should show differences. (Michelson-Morley-experiment). Since, however, surprisingly, no differences were measured, the idea of an absolute space was dropped. The theory of relativity was born. This theory can not decide whether there is an ether or not. The great physicist Dirac said in 1953, that the etherless basis of physics theory would soon reach the end of its validity.

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2. Working Strategy

Other ways had to be found therefore, because, using the same knowledge and the same methods, by default, the same (incorrect) results will be obtained. Therefore the following working strategy was devised:

1. For this work, only clear, concrete functional models can be used. Not one single abstract factor can be allowed. Everything must be clear down to the smallest detail and it must be possible to describe it with the parameters of classical mechanics. Absolute causality is the basic principle.

Causality
Causality is that relationship, in which cause and effect stand. With respect to events in nature, philosophically, an unbroken and complete causal relationship is assumed. In this the same causes result in the same effects. In physics one tries to relate events to previous events. The circumstance, that an event can only be the consequence of an earlier event, is called causality. From this can be deduced, that time travel is impossible, especially not into the past. In the theory of relativity, however, it is assumed, that there are events, which have no causal relationship since in time they are so remotely placed, that even light rays can not connect them. In quantum mechanics cause and effect are only connected by means of statistics.
This purely statistical interpretation, by default, results in a total break with all previous ideas in physics. Modern physics rejects determinism (causality) for the microcosmic events, but in so doing it also rejects it for any other events, generally, which are but built up from innumerable micro events. Einstein was convinced, that behind the world of quanta there was hidden the well known world of classical physics (hidden parameters). For this reason he consequently rejected the quantum theory.

2. Mathematics can only be used from now on, for example, to determine exact values or relationships, but in no case must fictional, abstract structures be “designed” without any relationship to reality.

3. The analytical method is not to be used any more, but rather that of synthesis. The question then is: How is space structured, to produce entities such as elementary particles, atomic nuclei, electric fields, magnetic fields, gravitation etc. and how do they exist?

4. The goal will have been reached in reducing all functional models designed to one functional model which then can be used and applied to all of physics.

2.1. Demands for a Unified Functional Model

We will now show the most basic demands required for such a functional model (there are many more), without using the knowledge gained from the completed theory.

We have two different particles, one A (proton), one B (electron). Each of these particles will repell another of the same kind. The repelling of the A-particles amongst themselves must be equally as strong as the repelling of the B-particles amongst themselves. However, A and B attract each other with the same force as the repelling force. On the outside nothing is noticed of this force, it has been neutralized. B is about 2000 times lighter than A, yet its electrical charge is just as strong as that of A, yet of opposite polarity.

Besides this there is another third particle C (neutron), which is neither attracted nor repelled by either A or B, nor does it have any electrical charge.

When A or B are moving, they generate a magnetic field at right angles to their direction of motion. If A moves, it generates a magnetic field which is identical with that of B, if it (B) moves in the opposite direction of A. Likewise B generates a magnetic field, which is identical to that of A, if it (A) moves in the opposite direction of B.

A and B rotate about their own axis and in so doing they also generate a magnetic field. If A rotates in a certain direction, then it will generate a magnetic field that in fact corresponds to that of B, if B rotates in the opposite direction of A. Likewise B generates a magnetic field, which in fact corresponds to that of A, if A rotates in the opposite direction of B.

Besides this, there is the third particle C (neutron), which, though it has no electrical charge, does, however, generate a magnetic field due to its “rotation”, which corresponds to that of B.

If A, B or C are moving, a resistance is encountered in the direction of motion, which has to be overcome. Without any further influence, these particles move uniformly in a straight line in the given direction.

Any deviation from this uniform,straight line motion again encounters resistance. In order to stop the particles, the same force must be expended, as was used to accelerate them.

At very high velocities a mass increase seems to be noticed in A, B and C, with simultaneous particle contraction in the direction of motion, as well as a slow down of time (dilatation). All three changes start at the same time and increase proportionally with uniform intensity in relation to the velocity.

Particles A and C can combine into atomic nuclei, in which case C can only remain stable inside the nucleus. At a certain size or certain amount of mass between A and C the nucleus becomes unstable (radioactive). This limits the number of particles A and C in the nucleus.

Among the particles A, B and C there is also a small attractive force which is identical with that of gravitation.

These few examples may be impressive, but they are only a fraction of the demands required for a functional model. It seems unlikely that in past publications the relatively simple functional model presented, did in fact perfectly fulfill all these highly complex and seemingly contradictory demands. Beyond this, it is the only solution of a functional model, that is possible, as has been found out in more than 30 years of research.a

2.2. Basic Problems

Against expectation, the main difficulty was found, not in the complication of the problem, but on the contrary, in the fact that nature “functions” rather simply. This is according to the principle: “This is as simple as is possible!” Man thinks much too complicated. The reason is, that a very simple solution of a difficult problem makes tremendous demands on the thinking apparatus. However, a complicated, elaborate solution of the same problem does not strain the brain at all. Therefore it is terribly difficult to find terribly simple solutions. (having quoted Paul Scherrer).

Present physics offers these complicated, elaborate solutions to problems, even in totally abstract form. Thus it was, at the beginning, a rather troublesome path to represent a concrete, realistic functional model based on all the connected facts, of which a partial field of physics consists. But the fact alone that such functional models could be realized (at first only for few partial fields of physics), was enough motivation to continue the work. To this must be added that these models did withstand any criticism, and so far no one has been able to refute even the smallest detail.

In the course of time a specific thought model developed from the individual functional models constructed, which made further work essentially easier. Conventional physics also has its own thought model.

After the basic functional models had been constructed with great effort, it was found to be fairly simple to reduce these to one fundamental model, for not once was there a choice among several possibilities. Inside the framework of this functional model, there is always only one specific solution possible. This makes it logically and factually consequent, since real events in nature agree exactly with this unified theory, and this all the more, as literally every single, physical function can be reduced to pressure and counterpressure. This is simple and it can not be simpler.

3. Foundational Prerequisites

The entire contents of the universe consists of an ideal gas, which is highly degenerated within high density zones. Density and pressure of this medium are extremely high, even if compared to the proportions inside the atomic nucleus. This gas consists of uniform particles called “space-quanta” (SQ). The volume of these SQ is many orders smaller than elementary particles. All elementary particles and force fields consist of these SQ. Compared to the normal SQ-density (static medium pressure) positive elementary particles constitute zones with smaller SQ-density (low pressure zone) and negative elementary particles are zones with greater SQ-density (high pressure zones).

Ideal, strongly degenerated Gas

The concept of an ideal gas is found in connection with the change of volume of gases. If this volume change is indirectly proportional to the pressure, which is imposed on an enclosed gas, then it is called an ideal gas. (Law of Boyle-Mariotte). Helium, a real gas, is considered an ideal gas at a sufficient distance from the condensation point. Water vapor, however, has an approximately 10% higher coefficient of expansion and can therefore not be called an ideal gas.

As a consequence of the equation of state it is also true, that the volume of an ideal gas is proportional to its temperature, as long as the pressure does not change (Law of Gay-Lussac). If a gas is heated it will expand if no extra pressure is exerted on the piston at the same time. Matter is called degenerated if it is totally ionized, that is, if the positive and negative particles are not coupled together. We know about so-called “free” electrons in a metal. If those electrons were bound to the atomic nuclei, then the metal would not be able to conduct electricity. By analogy: If in a gas all electrons are free, then the gas is called degenerated and often called a plasma. Since the atomic nuclei and electrons surrounding them are independent of each other, one can not talk about a common temperature any longer, which means, the concept of temperature has no more meaning.

Local pressure differences within a medium can only be kept up by outward energy input. For the existence of elementary particles it is therefore absolutely required to have a permanent energy supply. Therefore we postulate the introduction of a central oscillator (spherical transmitter of zero order), which transmits longitudinal, mechanical oscillations, with a frequency of about 10^{23} Hz, to the SQ-medium. These progressive waves are reflected at the periphery of the universe.

Spherical Oscillator of Zero Order

Most sonic transmitters (oscillators) can be classified in three basic types, depending on the type of direction of propagation, which are spherical transmitters of zero, first and second order. The spherical transmitter (or radiator) of zero order, also called “acoustic monopole”, can be represented by a pulsating sphere. This is a sphere which periodically changes its radius. The generation of sound therefore depends on a periodic change of volume. Thus sound propagates uniformly and symmetrically in all directions.

Longitudinal and Transverse Waves

Longitudinal waves can best be described as compressions and rarefactions of a medium, which due to mutual repulsion of the particles propagate with the so-called signal velocity. The waves are caused by a one time or periodic displacement of a particle or that of a spherical oscillator. If it is a periodic displacement, then the particles oscillate about their position of rest by periodically moving in the direction of propagation of the wave or against it. If the original oscillation is harmonic, then we have a sine wave. Sound waves are typically longitudinal waves. The signal velocity of sound is that velocity which depends on the medium.
Transverse waves are waves in which the particles move at right angles to the direction of advance of the wave. In these waves the crests and the valleys of the wave alternate. The point behind the crest of the wave, where no displacement occurs, corresponds to the zone of greatest compression. The corresponding point behind the valley in the wave is the zone of greatest rarefaction in longitudinal waves. Waves on the surface of a liquid are typically transverse waves. Electromagnetic waves also belong to the transverse waves. Their signal velocity is equal to the velocity of light.

Consequently, standing waves (SW) are generated, without gaps, in the entire space between the central oscillator and the periphery of the approximately spherical universe. Standing waves are the result of interference between two coherent, opposing waves of equal frequency and amplitude.

For the existence of elementary particles and force fields (such as gravitation) it is absolutely required, that the amplitude pressure of the SW will be significantly higher than the static SQ-medium pressure. This results in an asymmetry, because the amplitude pressure of the low pressure phase can only go to a zero value, while in the high pressure phase it can reach any value. This causes an oscillation, the negative half-wave of which has a smaller amplitude than the positive half-wave.

This, amongst other things, makes the signal velocity 'c' dependent on the pressure of the amplitude. We are specifically dealing here with mechanical, longitudinal waves (comparable to ultra sonic waves of extremely high frequency), which contrary to electromagnetic waves, can assume any energy values while remaining at the same frequency.

Progressive and Standing Waves
Two waves, which are simultaneously traversing the same medium in opposite directions will superimpose upon a standing wave, provided that both waves agree in amplitude, frequency and wavelength. Most often such standing waves originate if a longitudinal, one-dimensional (linear) wave or a transverse, three-dimensional, spherical wabe reaches superposition with itself after it has been reflected. A reflection results when entering into a thinner medium, as well as when entering a denser medium. If no reflection with above conditions is observed, then one calls it a progressive wave. The amplitude of the standing wave is twice as great as that of a progressive wave.

The frequency of 10^{23} Hz yields the elementary length of 10^{-13} cm, and likewise we have the elementary time period of 10^{-23} seconds.

Signal Velocity 'c'
The velocity of propagation of waves is also called signal velocity. It depends on the type of wave, and sometimes also on the wave length, but it always depends on the medium which oscillates, respectively on the medium through which the electromagnetic wave travels. Surface waves can be very slow, while pressure waves range from 170-5400 meters / second. Electromagnetic waves all have approximately the velocity of light. If dispersion shows up, then it is better called group velocity due to the different signal velocities found with different wave lengths.

Mechanical and Electromagnetic Waves (Difference)
While in mechanical waves particles of matter are oscillating, the propagation of electromagnetic waves is not bound to matter. Its signal velocity, contrary to that of mechanical waves, is nearly constant in different media and almost one million times greater. The potential and kinetic energy (energy of motion) of the mechanical wave corresponds to the average electrical, respectively the average magnetic energy density of the electromagnetic waves. The total energy density for both types of waves is proportional to the square of the amplitude. The outstanding difference between the two types of wabes, however, is this: The energy density of electromagnetic waves has a fixed relationship to the oscillation frequency. Mechanical waves, however, can assume any energy value at any frequency.

Interference
If several waves traverse a medium, superposition takes place, which is called interference. This calls for the principle of the undisturbed superposition (superposition principle), which means, that at any place and any time, the momentary displacements of the waves involved, may be added to obtain the resulting displacement. These resulting displacements may be positive or negative, which can also result in extinguishing the waves. The maximum total amplitude corresponds to the greatest possible displacement, which can be caused by the interference at a certain place at a certain time. Even light waves can interfere, provided they are coherent.

Static Medium-Pressure
A pressure exerted on a liquid or a gas, distributes over the entire medium in all directions with equal force. Or: Inside, as well as at the boundaries of a resting medium, which is not subject to external forces, the same pressure exists everywhere. This is the static pressure of the medium. This all around pressure distribution is explained by the easy displacement of the light-weight particles in liquids and gases.

Coherence
It is has been found, that several light sources in a room will never extinguish by interference or show any intensity patterns. The reason for this is, that different types of light sources generally are incoherent. If light waves from the same wave train are split by reflection, refraction or diffraction then the waves thus generated are called coherent. Only these types of waves are capable of interference. Laser light allows extreme coherence which is important in holography.

Sound Waves
Sound waves are mechanical, longitudinal waves. Originating from a sound source, an oscillating body, they travel in solid bodies, liquids and gases in the form of pressure variations (pressure waves). The human ear usually can hear frequencies from 16000 - 20000 Hertz. Higher frequencies are designated as ultrasound, lower ones as infrasound. The amplitude corresponds to the loudness, the frequency of the tone or the pitch, and the shape of oscillation to the overtones or harmonics. The velocity of sound reaches from 170 meters / second (in the noble gas Xenon) to over 1403 m / s (in water at zero degrees Celsius) to 5400 m / s (in quartz glass). In dry air of zero degrees Celsius the velocity is 332 meters / second.

Relationship Frequency - Oscillation Energy
Energy is transported in every wave as oscillation energy, which is passed on from particle to particle of the medium. Standing waves are an exception, the energy of which remains in the same place and is not transported. At the zero point a particle has maximum velocity and maximum kinetic energy. At the valley (return point) it has no velocity, but maximum potential energy, is proportional to the square of the amplitude. This means if the amplitude (loudness or volume in acoustics) is doubled, the energy will increase fourfold. If the energy for a small unit volume is calculated, which is the energy density, then it is found that it also is proportional to the frequency of a wave. If therefore the fre-

therefore the frequency of a wave is doubled, keeping the same amplitude (in acoustics this means one octave higher), then the energy density increases fourfold.

4. Definition of the Electric Field

All positive and negative elementary particles, being resonators, are forced to carry out radial pulsations in rhythm with the central oscillator (1023 Hz), thus generating progressive waves, which are identical with the electric field of the respective particle.

Negative particles (high pressure zones) reflect pressure as pressure and low pressure as low pressure. Positive particles (low pressure zones) however, reflect pressure as low pressure and low pressure as pressure, which results in a phase displacement of 180∫.

Between negative particles on the one hand and positive particles on the other hand, interference causes twice as high a pressure as can be found outside the particular particle. This is identical with the repulsion of like charges.

Resonators
A resonator is a device which can be excited to resonant oscillations. Some resonators are used to make acoustical measurements. Gas filled hollow spaces, of any shape (especially a sphere) with a neck for an opening are resonators comparable to a spring to which a mass is attached.The oscillation of the spring corresponds to the periodic change of volume of the gases in the sphere. The mass of gas in the neck is being moved back and forth. It can be shown, that such a sphere has a precisely definable resonant frequency which depends on the volume of gas, the dimensions of the neck, as well as the velocity of sound in that particular gas.
If many of those resonators of different size are lined up in a row, it is possible to make acoustical analyses, which are the records of the frequency portions of an acoustic wave. There are also resonators for electromagnetic waves. A well known example is the optical laser.

Due to the phase displacement of 180º , however, a compensation (extinction) occurs between negative and positive particles resulting in lower pressure compared to the pressure outside the particle. This is identical to the ”attraction” of unlike charges. The particles of course are not ”attracted” but pushed together.

Different Actions of Reflection (phase displacement) of Longitudinal Waves and Transverse Waves

Longitudinal waves:
If a stiff spring is elastically supported and brought to oscillation by pulling it down briefly, then a compression of the spiral windings will transmit downward to the end of the spring. When the compression has reached the end it runs out freely. A subsequent rarefication (loosening) of the windings runs back up. The reflection at the free or ”soft ” end turns the compression into a rarefaction, which is called a phase shift or phase displacement of 180 degrees.
If the spring is held tight at the lower, the free end, then the compression is reflected and runs back as a compression. In other words, the compression is not followed by a rarefaction, but another compression. A rarefaction will run back as a rarefaction. The reflection at the firm or ”hard” end will reflect a compression as a compression, and a rarefaction as a rarefaction.

Transverse waves:
If a horizontally supported rope is fastened flexibly at one end and the other end is made to oscillate by an upward thrust, then a wave crest will move to the other end of the rope. Since the rope is freely movable it can let the wave crest oscillation move upward freely. It is as if this end of the rope is subjected to an upward thrust, which runs back as a wave crest. A wave trough (valley) arriving will run back as a trough. The reflection at the free or ”soft” end sends a wave crest back as a wave crest and a wave trough is reflected as a trough. If, however, the rope is fixed at the end, then the rope end is not able to carry out an oscillation vertically to the direction of the rope. If therefore a crest arrives, then the previous rope particles can not fully carry out the motion imparted to them, since the fixed end of the rope exerts a pull downward on them, which results in a motional impulse that also goes down. This causes a wave trough to be formed which moves in the opposite direction. For the same reason an arriving wave trough runs back as a wave crest. A reflection at the firm or ”hard” end sends a wave crest back as a wave trough and a wave trough is reflected as a wave crest. This reflection action is called phase shift or phase displacement of 180 degrees.

The electrostatic repulsion and ”attraction” is based on two criteria:

1. All positive elementary particles pulsate in the same phase position. All negative particles pulsate in the same phase position.

2. Between positive and negative elementary particles exists a phase displacement of 180º.

Progressive waves generated by positive and negative elementary particles (which are resonators), do not only interfere with each other, thus causing the ”electric field”, but also interfere with the SW.

There is a superposition of the reflected component of the SW, arriving from the outside, with the negative particles. This causes a high pressure along the axis of incidence, which reaches its maximum value right at the particle and then decreases with the square of the distance.

The reflected portion of the component of the SW, (being 180º out of phase) and arriving from the outside, interferes with the positive particles. This causes a low pressure in the axis of incidence (by extinction), which reaches its maximum value right at the particle and then decreases with the square of the distance.

This interference with SW only happens, if the respective electrical charges are not compensated.

Low pressure or high pressure are thus only depending specifically on the wave. The static pressure of the medium is not changed. This can be stated as follows:

A positive electrostatic field causes a low pressure. A negative electrostatic field causes a high pressure.

5. Definition of the Biefeld-Brown Effect

Based on a proposal by Prof. Paul Biefeld (former fellow student of Einstein in Zurich), the physicist Townsend Brown carried out an experiment in 1923 as follows: A high voltage plate condenser was charged and suspended horizontally, being free to move. Townsend Brown observed that the condenser started to move on its own in the direction of the positive pole (low pressure) sustaining a constant thrust. When the condenser was vertically fastened to a beam scale a weight increase showed if the positive pole (low pressure) was pointing down. Correspondingly a weight loss occurred when the negative pole (high pressure) was pointing down. The intensity of the effect was determined by the size of the pole plate areas, the voltage level and the polarization capability of the dielectric.

The exact explanation for the event of this effect was given, in detail, under the title: 4. Definition of the Electric Field. Therefore, the Biefeld -Brown Effect has nothing to do with gravitation. It is a pure effect of the electric field.

Dielectric
A dielectric is a non-conducting substance, which is placed between two oppositely charged plates (for instance in a plate condenser).This changes the field strength between the plates. The type of change is described by a characteristic of the dielectric, called permittivity (dielectric coefficient). Vacuum and air have a minimum permittivity of one (1). Water has the highest permittivity (about 80). [A $BaTiO_3$ crystal can have a value of 2000, if the electric field is perpendicular to the principal axis of the crystal].

The Biefeld-Brown Effect directly proves the pressure decrease in the direction of the positive electric charge and that of pressure increase in the direction of the negative electric charge. This, in turn, is an absolute, basic requirement for the origin of a space quanta-flux (SQF), respectively that of a magnetic field. (Please see the following definition of the magnetic field).

This advances the Biefeld-Brown Effect to one of the most important, fundamental effects of physics.

6. Definition of the Magnetic Field

If a negative particle (e.g. electron) is moved it will create a high pressure zone at right angles to its direction of motion. Behind the negative particle the previous high pressure (caused by the presence of the particle) will decrease. This causes a pressure difference, which is again equalized by the space quanta flux (SQF). This SQF is identical with the ”magnetic field” and, with a negative particle, flows counter to the particle direction. (Fig. 1).

If a positive particle is moved, it creates at right angles to its direction of motion a low pressure zone. Behind the positive particle normal pressure will build up again.

Repulsion of Opposite Flows
In oppositely directed flows, particles in the boundary layers of the two flows hit each other slightly out of line (such as two billiard balls in a non-centered stroke). Thus the particles sustain an impulse which drives them apart. Oppositely directed flows therefore can not mix and will push each other aside (repulsion).

Pressure Decrease in Flows
A flow contains two pressure components: The static pressure of tjhe medium and the dynamic pressure caused by the flow. The static pressure corresponds to the potential, and the dynamic pressure to the kinetic (motional) energy of the medium. Since the energy of a stationary flow remains constant, this also is valid for the total pressure, which is made up of the dynamic and static pressure. If a resting medium is caused to flow (by opening a valve), then a dynamic pressure results and thus the static pressure of the medium decreases, in order to keep the total pressure the same. (Law of Bernoulli). This pressure decrease shows its effect at right angles to the direction of flow. The principle is used technicalls in many spray cans and atomizers, as well as in so-calles venturi pumps or hose end sprayers.

This causes a pressure difference which again equalizes as SQF (magnetic field). This SQF for the positive particle flows in the same direction as the particle itself. (Fig.2).

6.1. Induction

During induction the primary current produces an SQF opposing the direction of motion of the electrons. In the direction of flow a stagnation point develops with the free electrons of the secondary coil, which shifts the electrons in the flow direction to one end of the coil, as far as the electrostatic repulsion (negative pole) will allow it. At the other end of the coil this causes a deficiency of electrons (positive pole). Thus an electric voltage can be measured at the ends of the coil.

Moving electrons also generate a high pressure at right angles to their direction of motion. Behind the electrons the previous high pressure will again decrease. This pressure difference equalizes with a secondary-SQF, which is opposing the primary-SQF. These two SQ-

The Process of Induction
A voltage will be induced in a coil, if the magnetic flux penetrating it does change. A similar action occurs when moving a conductor across a magnetic field. This process is called induction. If the conductor loops are closed the induced voltage will generate an induction current. The prerequisite of induction is always a momentary change of the magnetic flux, which can be achieved by changing the magnetic field, or moving the conductor within the field. The induction voltage, respectively the induction current, in a closed loop always acts against the generating flux change (Lenz's Law). With an increase in the magnetic flux the induced current flows against the direction which is derived from the so-called cork screw-rule (right hand rule).

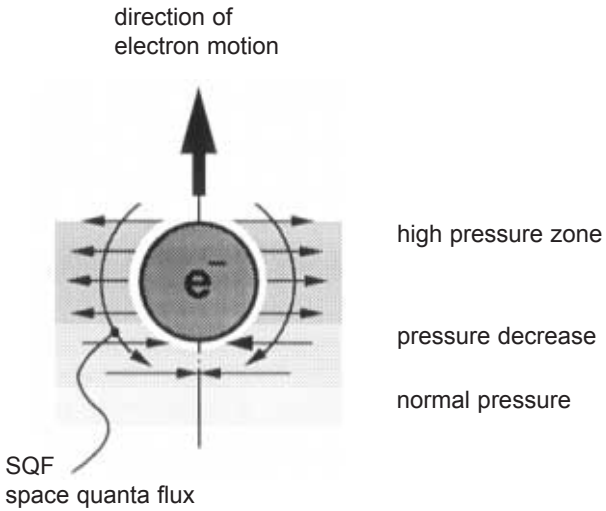


Fig. 1. SQF of moving, negative charge (electron)

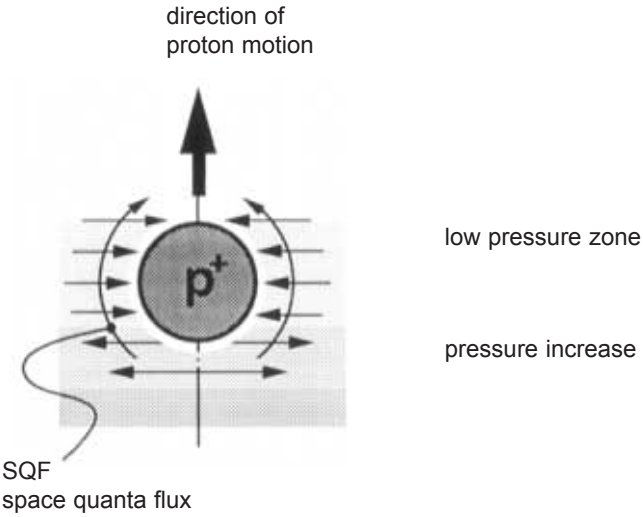


Fig. 2. SQF of moving, positive charge (proton)

If the primary-SQF remains constant, then the resistance of the conductor, as well as the electron stagnation at one end of the coil (repulsion of like charges), will cause the secondary electrons to slow down until they stop. This has decreased the secondary-SQF and now a stationary (primary-SQF) will form around these electrons, which will have symmetrical pressure points at the front and the back. There is no voltage to be measured at the coil ends at that moment. (Fig. 4).

Stationary Flow (Pressure Points)
A flow (flux) means a motion of liquid or gases. The cause of a flow are, for example, gravitation or pressure differences. In order to designate the direction of motion of the flow one uses streamlines. If the paths of the individual particles agree with these streamlines, and if the streamlines keep the same shape for some time, then the flow is called stationary.
If an ideal (frictionless) liquid flows around a sphere, then a stagnation point is formed at the foremost point of contact. At this point the flow velocity becomes zero and simultaneously a maximum pressure builds up at that point (pressure point). Starting at this point the flow will split, flow around the sphere and form another analogous point on the opposite side 180º away. The flow velocity will increase and reach its maximum value at the equator of the sphere, then decrease until it slows to a standstill at the opposite stagnation point.The pressure decrease inside the flow (at right angles to the flow) around the sphere, will reach its maximum value at the point of the maximum velocity, which is at the equator of the sphere.The forces acting on the sphere at the two stagnation points or pressure points are of equal magnitude, but oppositely directed, thus compensating to zero (see also 12.9 in the Glossary).
No forces will act on a sphere submerged into the (constant) flow of an ideal liquid. On the other hand, a sphere will not be subject to any resistance, of it moves with a constant velocity (uniformly-straight) through a resting, ideal liquid or a resting, ideal gas.

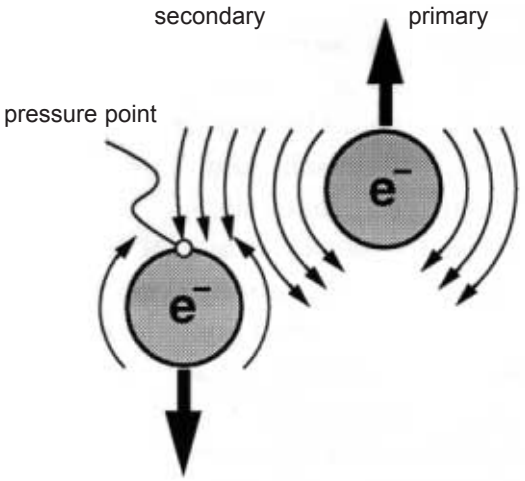


Fig.3. SQF at Closing Circuit for Primary Current

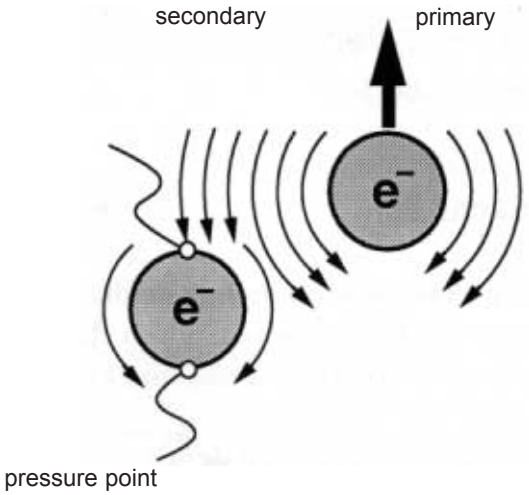


Fig.4. SQF at constant Primary Current

If the primary current is switched off, thus decreasing the primary-SQF, the rear pressure points of the secondary-electrons will be relieved first and then they receive an impulse from the front pressure points in the opposite direction (compared to the initial current switched on). Again the electrons are pushed to one of the coil ends (negative pole), as far as the electrostatic rejection pressure will allow. This causes a deficiency of electrons at the other end (positive pole). A voltage can now be detected at the ends of the coil.

The moving secondary-electrons themselves create a high pressure at right angles to their direction of motion. Behind the electrons the previous high pressure builds up until it reaches normal pressure. The pressure difference equalizes with a secondary-SQF in the same direction as that of the primary-SQF. Between both of these SQF, flowing in the same direction, a low pressure builds up, which due to the static pressure of the medium will push them together (”attraction”). In the primary coil we see, analogous to this, the decrease of the primary-SQF with a simultaneous, so-called break surge. (Fig.5).

6.2. Self-Induction

If an electric voltage is applied to the ends of a conductor (for example a coil), then the free electrons will move in the direction of the positive pole, and generate an SQF opposite to the direction of motion. Each free electron will hinder adjacent electrons due to the structure of its own specific SQF (opposite to the direction of motion). This will achieve a common flux with symmetrical pressure points in the front and the back of the electrons. When the current is turned off the SQF decreases again by relieving the front pressure points first.

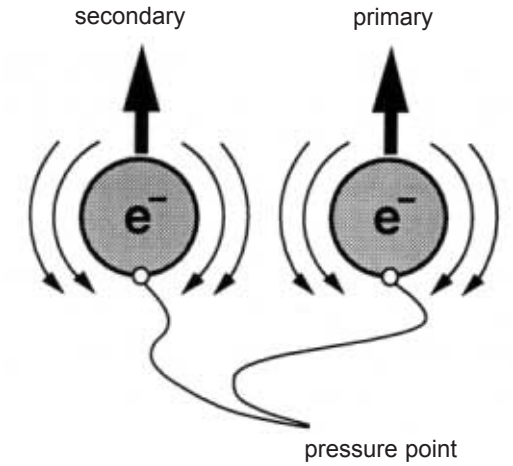


Fig.5. SQF when switching off primary current

The rear pressure points now impart an impulse to the free electrons which is identical with the break surge.

Self-Induction
Changes of the magnetic flux induce a voltage not only in another conductor, but also in the coil itself which produces the magnetic field. This phenomenon is called self-induction. In this case the voltage generated by self induction opposes the change of current in the coil, which first caused the induction.

6.3. Magnetic ”Attraction” and Repulsion

The magnetic ”attraction” and repulsion follows the Bernoulli-Principle:

Flows traveling in the same direction (SQF) ”attract”
Flows traveling in opposite directions (SQF) ”repel”

The pressure decreases in any flow at right angles to its direction of motion. This is also true for the SQF. The static SQ-medium pressure acts as a radially, inward directed force on any SQF (e.g. pinch effect, Fig.6). Two SQF in the same direction do not ”attract” each other, but they are pushed together by the static SQ-medium pressure.

Field lines used before are an exact cross section through the SQF (disregard vector arrows) and are identical with equipotential surfaces. They are an excellent help to represent the exact path and the local intensity of the SQF.

The magnetic field of a cylindrical bar magnet consists of the SQF revolving, in a circle, around the cylinder axis. In any sector of such a circular flux there is at 180º on the opposite side a sector in which the flow is of opposite direction. [This is more easily seen if the circle is really small]. Since opposing flows repel, this causes an expansive pressure, working from the inside to the outside on the entire circular SQF-flow. This pressure wants to divert the flow, as is well seen in the field lines of a bar magnet, especially at the poles (Fig. 7). On the other hand, the static pressure of the medium exerts a radial pressure from the outside on the SQF trying to compress it at right angles to the direction of flow

Fig. 6 **Pinch-Effect**
Electrodynamic effect of current surges (200 000 A, period of discharge 30 ms). (a) copper sheet 300 x 75 x 0.2 mm; (b) copper tube 300 mm long, diameter 15 mm, wall thickness 0.3 mm; (c) basket antenna with 8 wires each 4 mm diameter. Photos (a), (b) and (c) each show object before and after current surge.

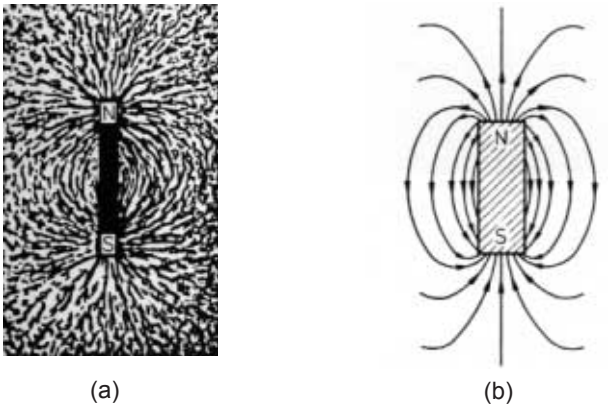
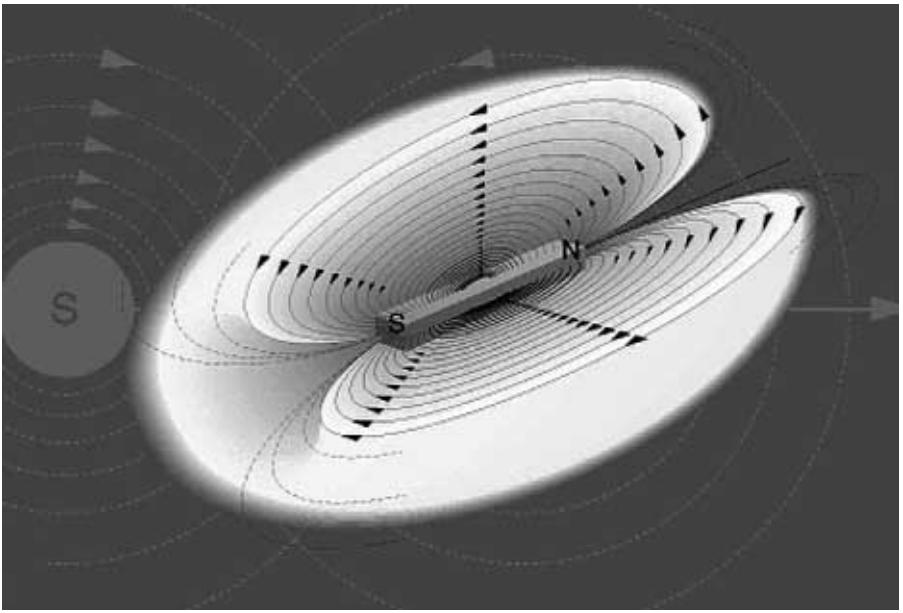
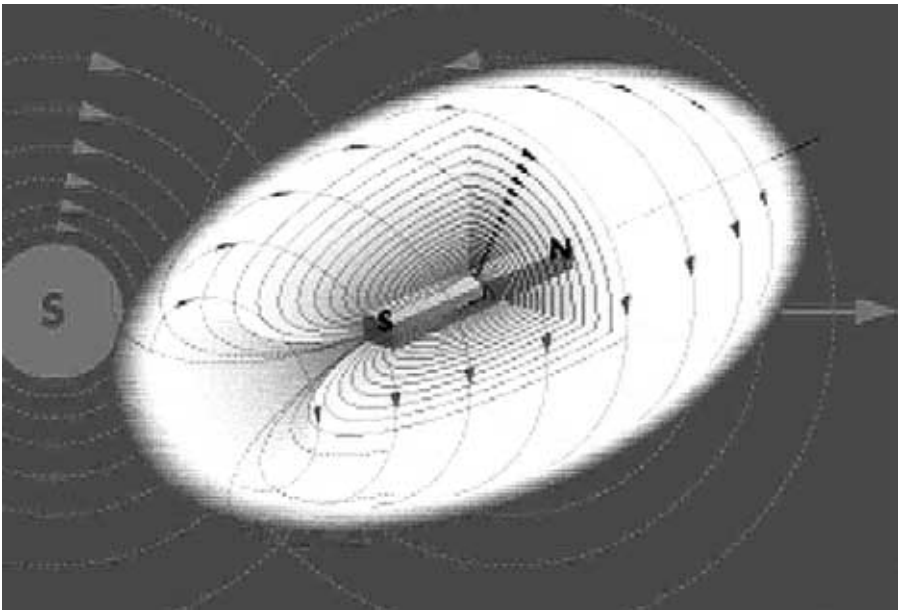


Fig. 7. Field lines of a bar magnet (a) made visible with iron filings (powder); (b) some lines drawn (disregard vector arrows). Both pictures correspond to a cross section of the SQF.



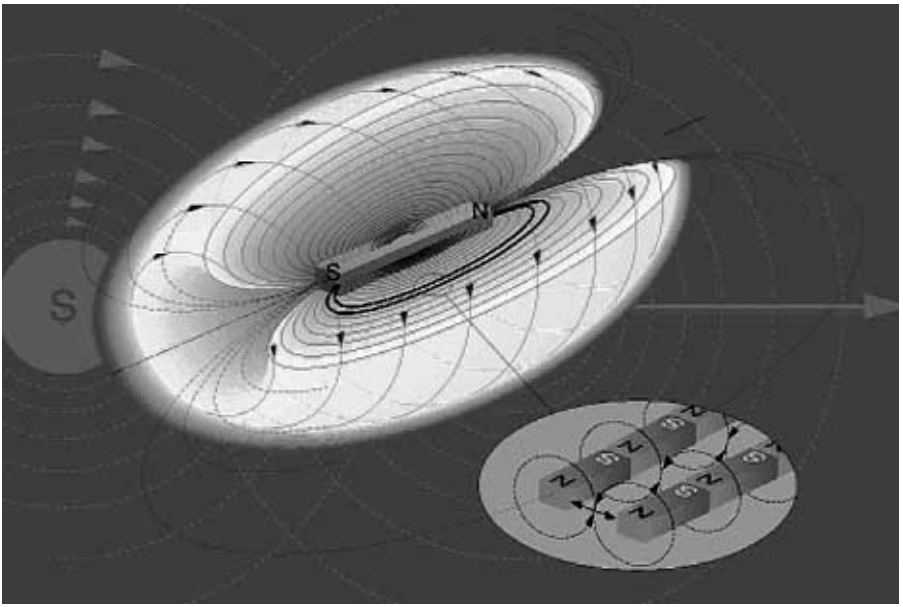
Previous Representation of the Magnetic Field

The previous representation of the magnetic field with vector arrows pointing from the north pole to the south pole.



New Representation of the Magnetic Field

The magnetic Space-Quanta-Flux SQF_m according to O. Crane. The rotation of the magnetic flux is in a clockwise direction around the longitudinal axis, when looking at the southpole of a bar magnet.



Space-Quanta-Flux and Field Lines

The magnetic Space-Quanta-Flux SQF_m according to O. Crane and the mutual repelling of the field lines (shown enlarged), based on the theory of the repelling of flows in opposite directions. (Fluid Dynamics according to Daniel Bernoulli, 1700-1782).

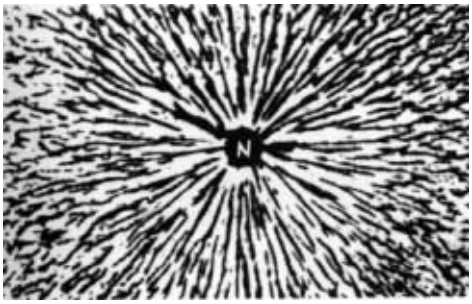


Fig. 7c. Magnetic field lines coming from the pole of a bar magnet which is standing upright. The SQF is being forced apart.

The effects of forces between two SQF can be well demonstrated by juxtaposing two equal, permanent cylinder magnets. Around each cylinder rotates an SQF. If like poles are side by side, then the SQF are flowing in opposite directions and repelling takes place. (Fig.8a). If unlike poles are side by side, the SQF are flowing in the same direction. Between the two magnets there exists a low pressure and therefore they are pushed together by the static pressure of the medium (Fig. 8b). Even stronger effects can be observed if the poles are directly placed together with their faces.

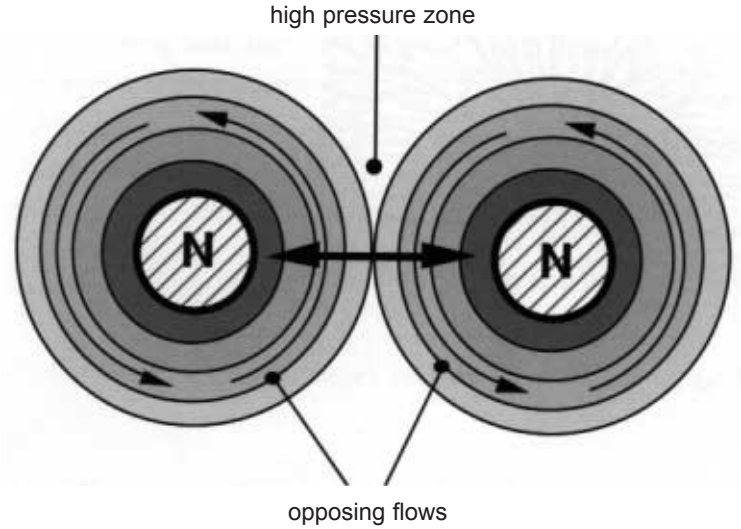


Fig. 8a. Repelling of opposing SQF

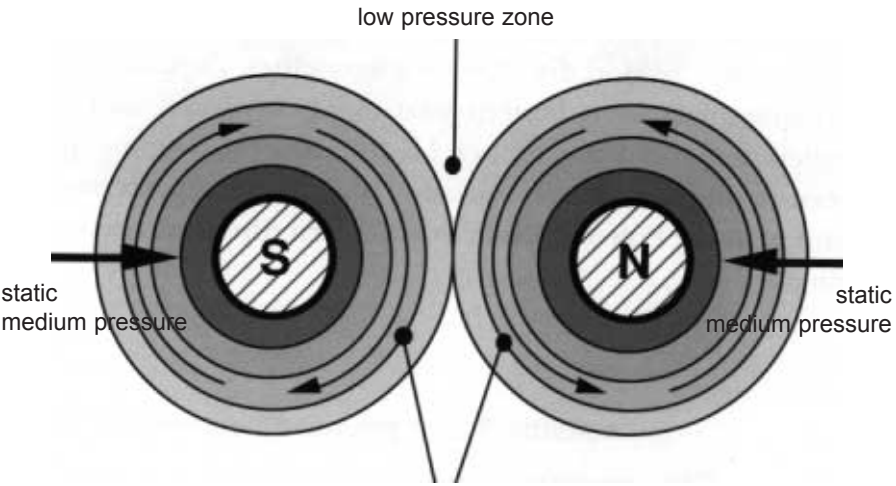


Fig. 8b. Effect of low pressure (”attraction”) of SQF in same direc-

Current carrying conductors with current in the same direction are pushed together by the static pressure of the medium which is due to the SQF being in the same direction (Fig.9a). If the SQF are going in opposite direction the conductors will repel (one-sided repelling pressure, Fig.9b). The same is true of coil windings, on which a force is acting which tries to stretch the windings (Fig.10). The skin effect also results from repelling of opposite SQF at high frequency.

6.4. Determination of the SQ-Flux Direction

Looking at a north pole the SQF is moving counterclockwise. Looking at the south pole the SQF moves clockwise.

In spin magnetism the SQF moves counter to the direction of spin rotation with negative elementary particles (Fig. 11a) and with positive elementary particles it moves in the same direction as the spin rotation (Fig. 11b).

Spin-Magnetism
A particle moving on its path has a spin impulse which leads to a magnetic moment. The particles, however, due to the spin, have an additional magnetic moment which goes in the direction of the spin. Using this magnetic spin one can determine, in principle, the direction of the spin. This is done by deflection of the magnetic moment in a magnetic field. One finds that the spin can only take certain orientations to the magnetic field. From spectroscopic measurements one must conclude that the magnetic moment, due to the spin, is about twice as large as should be expected according to the formula. This magneto-mechanical anomaly can only be explained if one assumes that with a charged particle the direction of the rotational impulse does not agree with the direction of the magnetic moment.
It is interesting, that the neutral neutron obviously also has a magnetic moment and that the proton likewise shows an abnormal value. The phenomenon is explained with virtual particles.

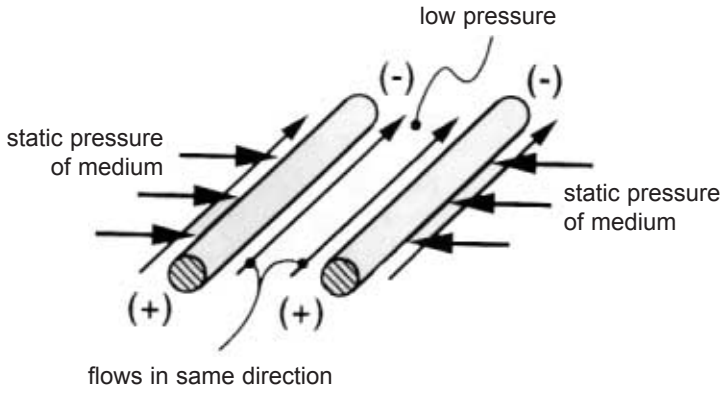


Fig. 9a. Effect of low pressure (”attraction”) of SQF in same direction.

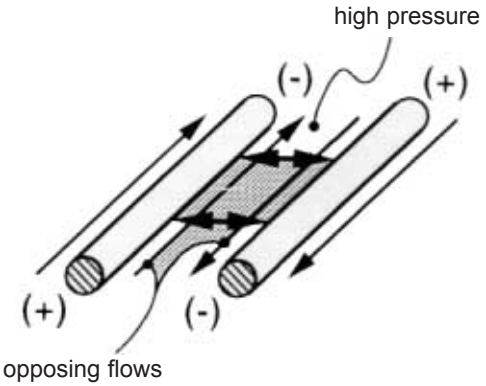
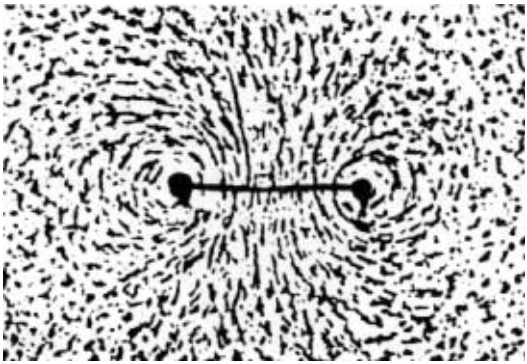
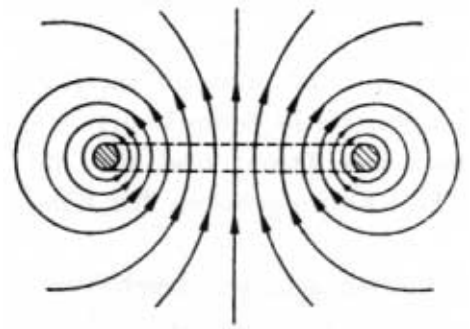


Fig. 9b. Repelling of Opposite SQF.



(a)



(b)

Fig. 10. Picture of Magnetic Field Lines of a Current Loop; (a) made visible with iron powder (b) drawn (please disregard vector arrows). Both pictures are a cross section of the SQF.

Moving Electric Charges:

With negative elementary particles the SQF moves opposite to the particle motion. With positive elementary particles the SQF moves in the same direction as the particles.

6.5. Effects on Current-Carrying Conductors in a Magnetic Field

A current carrying conductor generates an SQF opposite to the direction of the moving electrons. If a conductor with a DC current is placed in the field of a bar magnet, so that the SQF of the conductor will be parallel but of opposite direction to the flow of the SQF of the bar magnet, then the SQF of the magnet will impart a repelling pressure on both sides of the opposing SQF of the conductor. This will, for the most part, compensate the repelling forces for the conductor.

For the current carrying conductor now exists a pressure decrease between the static pressure of the medium acting radially from the outside and the increasing low pressure in the direction towards the center of the circularly rotating SQF. This assures that the conductor is not ejected from the SQF of the magnet (as would be expected), but is pushed towards the center. The static pressure of the medium pushes the conductor into the center of the flow (Fig.12a).

From this moment on the repelling pressure acts only unilaterally on the conductor, in the direction of the sector on the other side at 180º, which moves in the same direction as the SQF of the conductor.

SQF of electron
seen from above

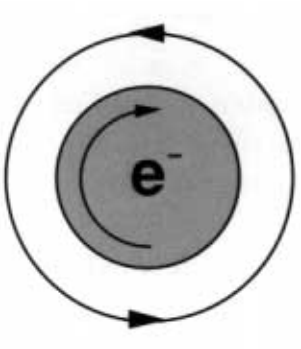


Fig.11a. Spin-Magnetism (Spin-SQF_m) of Electron

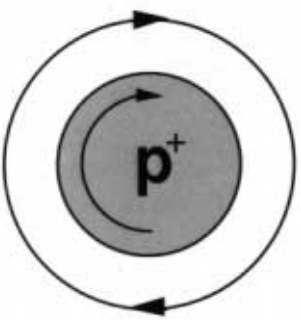


Fig.11b. Spin-Magnetism (Spin-SQF_m) of Proton

The static pressure of the medium now pushes together these SQF which flow in the same direction. (Fig. 12b).

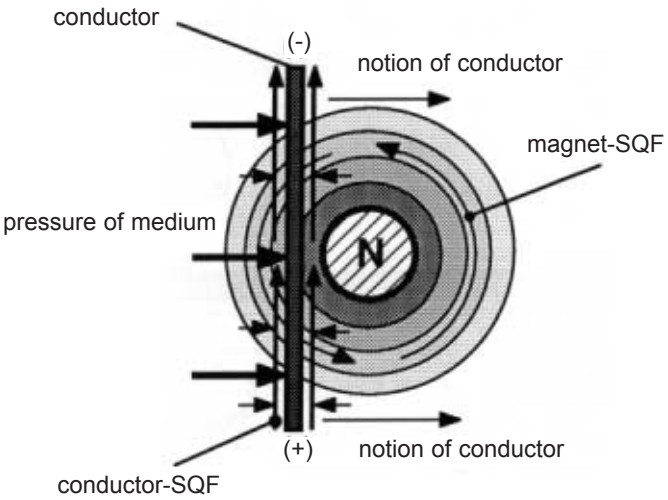
The current carrying conductor is acted upon by a force, which tries to displace it, so that the SQF of the conductor and the SQF of the magnet will form flows which run
in the same direction.

The reverse of this principle (conductor stationary, magnet moving) results when a freely moving compass needle is brought near the SQF of a conductor carrying a DC current. If the conductor is parallel to to the needle, the SQF above will be opposite from that below the needle. (Fig. 13). If the conductor is placed vertically, one can guide the needle around the conductor and show that the direction of the SQF stays constant all the way around. (Fig. 14).

6.6. Inductive Effects on Moving Conductors in a Magnetic Field

A resting, free conductor-electron is always surrounded by a stationary flow inside a constant SQF. This is the reason a constant (steady) magnetic field does not have an effect on a resting electron.

If a conductor is moved inside an SQF (for example in the circularly rotating SQF of a permanent magnet), then the free electrons inside the conductor are displaced by the one-sided flow pressure as compared to the non-displaceable protons. The free electrons generate their own SQF, opposite to their direction of motion.



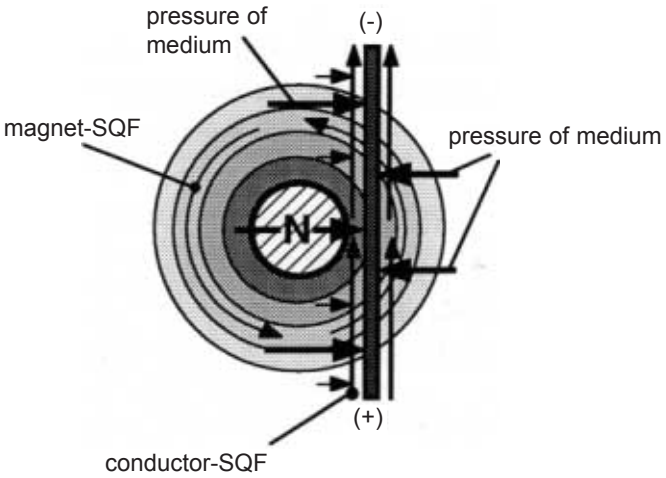


Fig. 12. Effects on a Current Carrying Conductor in a Magnetic Field

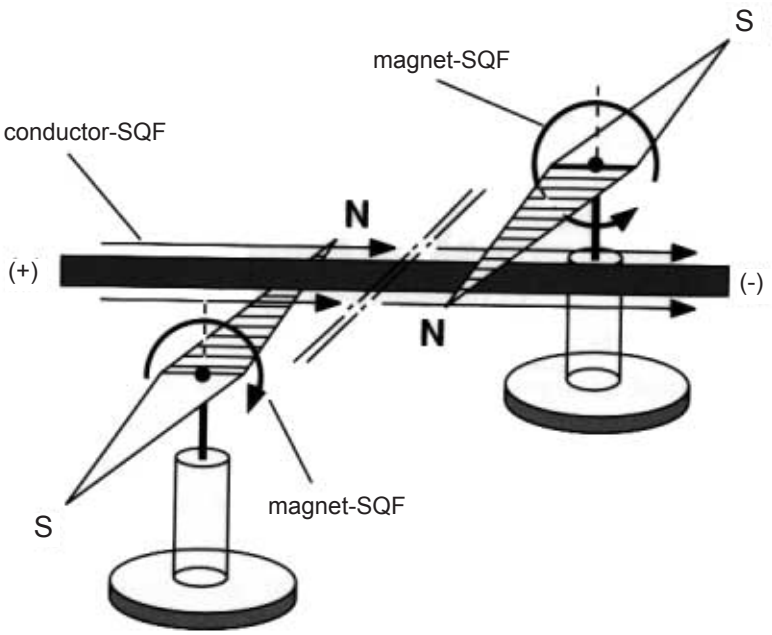
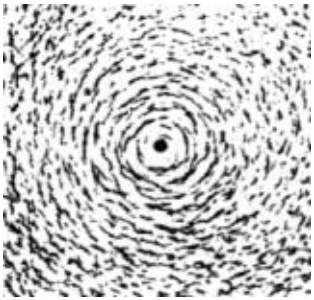


Fig. 13. The magnetic needle will so position itself that the SQF of the conductor and the SQF of the needle form unidirectional flows

Fig. 14a. Proof of unidirectional SQF on a vertical conducto.



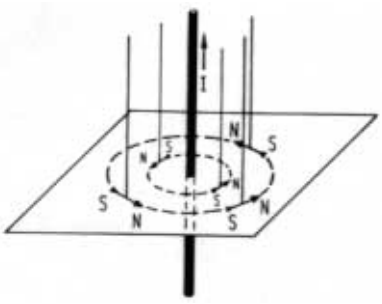


Fig. 14b. Using iron powder to make visible the cross section of SQF in a plane at right angles to the conductor.

A force now acts on the conductor which tries to displace it, so that the SQF of the conductor and that of the permanent magnet will make up unidirectional flows. This was described above under: 6.5 Effects on Current Carrying Conductors in a Magnetic Field. Since, however, the conductor is not moving in this manner, the free electrons inside the conductor are repelled by the oppositely directed SQF of the permanent magnet. and ”attracted” by the SQF which flows in the same direction. The free electrons are thus pushed to one end of the conductor, as far as the electrostatic repelling allows (negative pole). At the other end this causes a deficiency of electrons (positive pole). Therefore at the ends of the conductor a voltage can be measured, as long as the motion continues (Fig. 15).

6.7. Effects on Moving Electric Charges in a Magnetic Field

A moving electron generates an SQF opposite to its direction of motion. If a moving electron enters a constant (non-varying), magnetic field (such as the circularly rotating SQF of an electromagnet) parallel to the SQF of the magnet and in the direction of flow, then the SQF of the magnet imparts a repelling pressure on the opposite SQF of the electron, on both sides, at right angles to the motion of the electron. This will compensate the repelling forces on the electron as a whole and it will not be rejected out of the SQF of the magnet, as should have been expected.

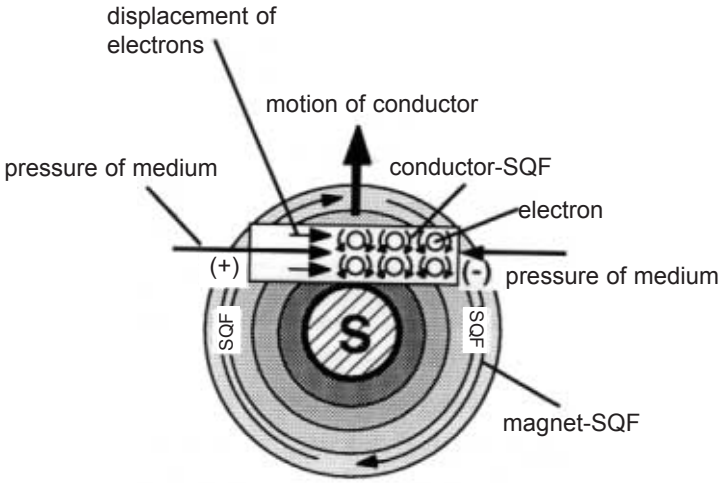


Fig. 15. Inductive Effects on Moving Conductors in a Magnetic Field.

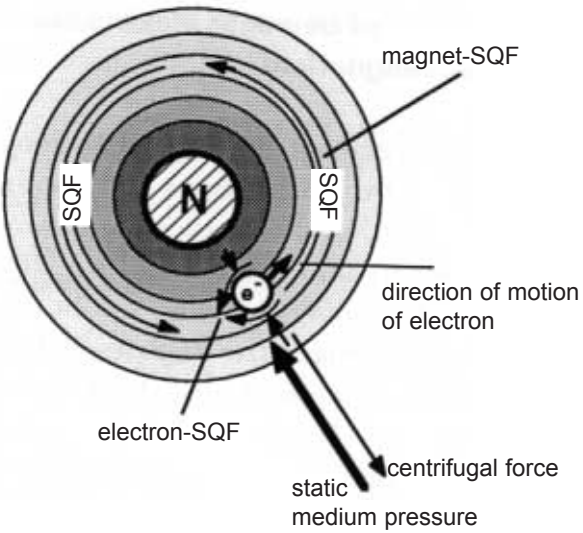


Fig.16. Effects on Moving Electric Charges in a Magnetic Field.

Now we have a pressure decrease for the electron between the static medium pressure acting radially from the outside, and the increasing low pressure in the direction of the center of the flow. The electron therefore follows a circular path inside the SQF of the magnet. The static medium pressure [= pressure of the medium; medium does not mean middle or average] which acts on the electron from the outside and the centrifugal force will compensate. The radius of this circular path is dependent on the velocity of the electron and the field strength of the magnet (Fig. 16).

If an electron, however, as was desribed above, enters a magnetic field at an oblique angle with respect to the SQF of the magnet, then, during its forward motion, it will be continuously deflected in a circular pattern and will thus describe a spiral path.

6.8. Inductive Effects on Current Carrying Conductors in a Magnetic Field

If a direct current carrying conductor (e.g. a rectangular, thin copper plate) is placed into a magnetic field, so that the SQF of the conductor is moving parallel to the circularly moving, rotating SQF of the magnet, then a force will act on the conductor which will try to displace it in such a manner that the SQF of the conductor and the SQF of the permanent magnet will form unidirectional flows.

Since, however, the conductor is not moving this way, the free electrons inside the conductor will be repelled by the opposite SQF and ”attracted” by the SQF flowing in the same direction. The free electrons are therefore pushed to one of the long sides of the copper plate, as far as the electrostatic repelling force allows (negative pole).

On the other side a deficiency of electrons will result (positive pole). On both of these long sides (at right angles to the current direction of the conductor) a voltage can now be measured. This voltage is identical with the Hall-Effect (Fig. 17). The action corresponds, in principle, to the above mentioned description of: 6.5 Effects on Current Carrying Conductors in a Magnetic Field.

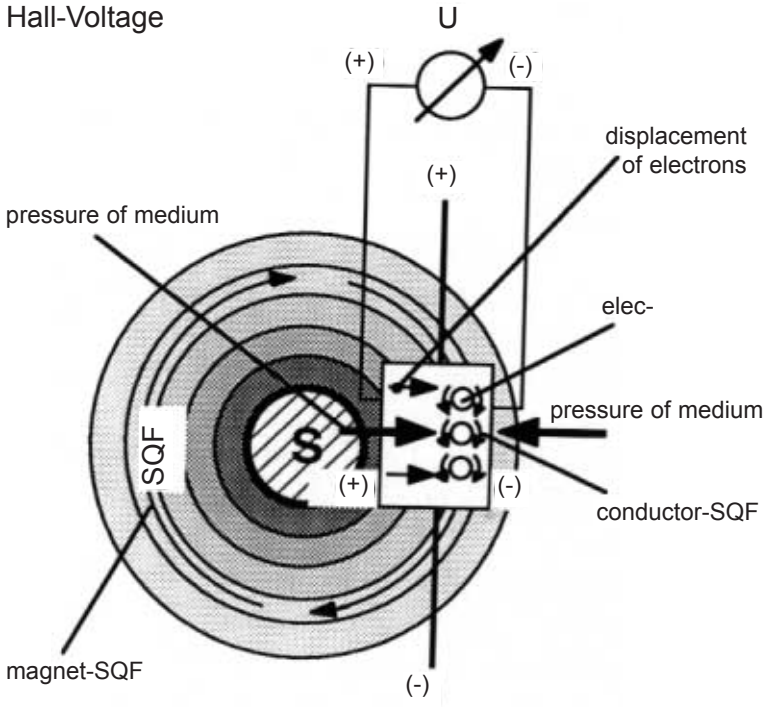


Fig. 17. Hall-Effect

7. Quantum-Mechanics

The functional model presented here, provides, among other things, the solution of all problems of quantum mechanics with the parameters of classical mechanics (as predicted by Einstein).

An electron can never ”crash” into the nucleus, since its own SQF_t is between them, i.e. the electron and the nucleus. (see Glossary 12.7 to 12.9). The electron is not ”magically” transformed into a standing wave around the atomic nucleus.

When a ”quantum jump” occurs, a sufficiently strong impulse must be imparted to the electron (having its own SQF_t), so that it can be lifted above the SQF_t of the electrons which remain below.

Pauli-Principle
In quantum mechanics one deals with particles which are especially described as a wave, in such a manner, that the square of the wave function corresponds to the probability for the position of the particle. Quantum mechancis does not make any absolute statements any longer, but instead describes the probability of an event or a position. An important statement of quantum mechanics is the identity principle, according to which the exchange of two particles, which show no physical differences, does not lead to any new state.
There are, however, particles called fermions, which follow a peculiar law called Pauli-Principle or Pauli Exclusion: If the mutual effects of two fermions are observed, which are in the same state, (i.e. they have the same wave function), and if one calculates their probability for position, then one finds this value to be zero. This means, the particles do not exist. The conclusion is that the two particles can not both be in the same state. This is a rather abstract consequence of the quantum mechanical formalism.

On a common orbit two electrons always move in the same direction and are always at the greatest possible distance from each other (180º opposite). The SQF_t of the other electron, which is 180º away, moves in the opposite direction, which results in mutual repelling. The same is true of the magnetic orbital moment, as well as spin magnetism (opposite SQF_m compensate each other). Any other configuration prevents electrostatic repelling.

The stability of electron orbits is based on the compression and expansion of the SQF_t. An outward pressure on an electron compresses the cross section of the flow. This increases the velocity of the flow, which in turn speeds up the electron also, which then increases the centrifugal force. This removes the electron somewhat from the atomic nucleus, respectively from the SQF_t of the outer electron shell. This will expand the cross section and slow down the flow, including the electron, which is now pressed upon by the electrostatic pressure until compensation takes place by the centrifugal force. Moreover, emission and absorption of photons are always accompanied by velocity changes of the electron.

Zero-Point Energy
If a gas is cooled off, the temperature movement of its atoms is reduced. At the absolute zero point (-273.16º C) this temperature movement should come to a complete halt. Therefore, at sufficient cooling off all substances should crystalize in solid form. But, helium does not become solid, under normal pressure, even at the lowest temperatures.
This proves, that even at the point of absolute zero, some motional impulse must exist, namely the zero-point energy. The more space is confined for a particle, the faster it will move (e.g. nucleons in the nucleus of the atom), which points to an increase of the zero-point energy.

There are analogous conditions and principles for the nucleus of the atom. However, the pressure is not caused by electrostatics, but by the static medium pressure, as against the low pressure inside the nucleons. It now becomes clear, why it is not possible to create atomic nuclei with anti-nucleons (high pressure particles).

Between the nucleons in the nucleus the SQF_t prevents a direct contact, which explains repelling at close distance. The high velocity of the nucleons in the nucleus results from the compression of their SQF_t .

The continuous reflection of elementary particles at the SW (which is an absolute prerequisite for the existence of elementary particles, see Chapter 8.1), creates an unavoidable, continuous, minimum particle motion, which is caused by a certain SQF_t . This corresponds to the absolute minumum of zero-point energy which is required for the existence of an elementary particle. By narrowing the space for motion, the SQF_t is compressed, which increases the velocity flow, thus accelerating the particle. This creates additional zero-point energy (nucleons in the atomic nucleus).

This effect is also based, (how could it be otherwise) on the Bernoulli-Principle.

8. Elementary Particles

8.1. Structure of Elementary Particles

Electron / positron and proton / antiproton can only be stabilized inside the antinode (pressure point) of the standing waves SW.

If the elementary particles however, would stay instead in the node (of oscillation) of the SW, then each elementary particle would have two different possibilities for a stay, which would differ from each other by a phase shift of 180º. All loops which are in a compression phase, are neighbors to loops which are, at the same time, in the rarefaction phase. This configuration would make it impossible, amongst other things, for electric and magnetic fields to exist.

The only place for the location of an elementary particle is therefore the antinode (pressure point). But only at the nodes, which are in a compression phase, are elementary particles reflected.

Pressure Point (Antinode) and Pressure Loop (Node) in Standing Waves SW
Standing waves show, at regular distances of a quarter wavelength, places where the displacement is always zero, respectively, at the maximum value of the amplitude. The node (displacement equal to zero) corresponds to the pressure loop (maximum compression or rarefaction). The antinode (displacement equals amplitude), corresponds to the pressure point (zone of maximum density). The standing wave oscillates statically or stationary, no energy is being transported. A particle at the node is always at absolute rest, while a particle at the antinode will alternately pulse fully to the right and then to the left during one period or cycle.

Thus the required coherence for the electric field is given. (see Sketch).

After any half cycle each compression of the SW changes into a rarefaction and vice versa. In between, however, there is a moment each time, in which the displacement of all points of the SW equals zero. The high pressure of a progressive wave, and the low pressure of the opposing, progressive wave, compensate mutually in the SW. This ”appearing” and ”disappearing” of the standing wave occurs twice in any full oscillation cycle. However, the prerequisite is, that the amplitude pressure is lower than the static medium pressure. Only in this case will the positive and negative half-wave possess the equal amplitude required for compensation.

Electron / Positron - Proton / Antiproton
The electron and the proton are elementary particles which constitute the main components of matter. The positively charged protons, together with the neutral neutrons make up the atomic nucleus of material elements, while the negatively charged electrons describe circular orbits around the nucleus. In neutral atoms the number of electrons equals the number of protons. In artificial nuclear transformations (decay) caused by collision of elementary particles, sometimes radiation will result, which is called beta + radiation consisting of particles, which, except for their charge, are identical with electrons: Positively charged positrons, the antiparticles of the electrons.
The proton also has an antiparticle, which similarly, except for its sign of charge, is identical with the proton. If a particle and an antiparticle collide decay will result. Both particles will change into gamma radiation, an electromagnetic radiation of very high frequency. The reverse of this process is called pair production.

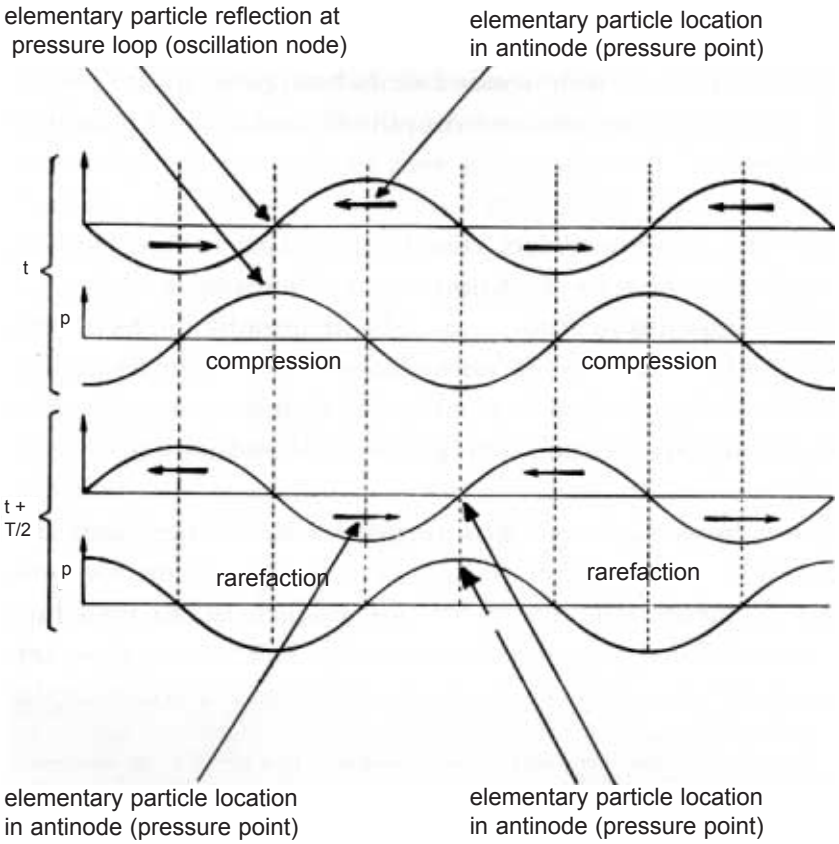
In the case at hand (SW in the SQ-medium) the amplitude pressure is definitely larger than the static medium pressure. This results in an asymmetry, because the pressure in the low pressure phase can at most reach the value zero, however, in the high pressure phase it can rise to any value. This causes an oscillation, the negative half-wave of which will have a smaller amplitude than the positive half-wave.

Consequently, only a partial compensation takes place in the ”extinction-phase”, which leaves only the non-compensated part of the particular wave.The ”extinction” phase is thus superimposed by a progressive wave, which will always move on to the next compression loop (see Sketch).

This process is of basic importance, since only the continuous reflection at the SW makes possible the existence of the elementary particles.

Oscillation Period
The oscillation period, or the duration of oscillation ‘T’ is that time which passes during the execution of a full oscillation. This time is equal to the reciprocal of the frequency: T=1/f. In mechanical waves the bandwidth reaches from earthquake waves with a period of 100 seconds to hyper sound waves with a period of 10 billionth of a second (10^{-9}). In electromagnetic waves the bandwidth reaches from a tenth of a second to gamma rays with a period of 100 quadrillionth (10^{-15}) of a second and more.

Amplitude - Displacement
The amplitude is the greatest shift of the exciting oscillation of a wave. The displacement is the momentary shift of a particle from its position of rest, which is the solution of the wave equation which reads:
Displacement = amplitude times SIN (2 times p times frequency times [time - distance / signal velocity]).
The distance (path traversed) is the separation from the center of excitation. If we are at a crest, the displacement is maximum and equal to the amplitude. For electromagnetic waves analogous equations hold true for voltage, current, the electric and magnetic field.



Principle Sketch: Location of elementary particles inside the standing waves (SW)

Here the wave is not reflected from the particle, but just the reverse, the particle is reflected from the wave.

Elementary particles therefore consist of compressed or rarefied SQ-zones, which are totally reflected inside the SW from temporarily appearing, progressive waves. These always move on, together with the reflected particles, to the next originating compression loop. Here the particles are compressed by the oppositely moving, progressive wave, and then they are reflected again (see sketch).

During the transport to the next compression loop the elementary particle will expand again, if it is a high pressure particle, or else the same happens with 180º phase displacement. During this oscillation the elementary particles produce progressive waves which are identical with the electric field. They do this while acting as spherical oscillators of zero order.

With every pulse of the SW follows a reflection. A total reflection within the SW only happens if there exists a certain relationship between the amplitude pressure of the SW and the SQ-density within the SW. A differentiation has to be made between the density of the electron / positron and the proton / antiproton. Only those two states are stable.

If the critical SQ-density in a ”photon” (soliton) is not reached, then there will be no electron / positron synthesis. If, however, the density is surpassed, then the critical value is totally reflected, and the high pressure of the electron is compensated in the form of SQ-release, while the low pressure of the positron is compensated by SQ-inta-

In both cases the energy surplus is converted into kinetic energy of the particles.

The pair production of elementary particles, however, is not forced. At appropiate SQ-compression inside of the SW, only electrons will originate, and if the required higher compression is reached, only antiprotons will result.

At appropiate SQ-rarefaction inside the SW, only positrons will originate, and if the required higher rarefaction is reached, only protons will result. Nature was utilizing this potentiality when originating matter.

In order to create spin-magnetism at least three reflection points are required within the SW (120º distance). However, it is very likely that there are five reflection points, each at 144º, which corresponds to 2 ”revolutions”. With only two reflection points (180º distance) spin magnetism will no longer be possible, since the pressure equalization by the SQF_m now proceeds symmetrically right and left of the reflection point (mesons).

Elementary Particle -Spin - Spin Angular Momentum
Spin is an intrinsic angular momentum of a particle with a fixed value, being characteristic for a specific type of particle. One can assume a particle to be a small top in space, turning with a fixed angular velocity. There are particles with half integral spin (fermions) and particles with integral spin (bosons). The spin of an atomic nucleus is composed of the spins of the neutrons and protons (both fermions) which make up the nucleus.

Mesons
Elementary particles can roughly be separated into three groups according to their weight. Light weight leptons (i.e. neutrinos), heavy baryons (i.e. neutrons) as well as mesons. Those are mostly average weight pions and kaons, which both appear charged and uncharged and have a very short life on the order of a billionth (10^{-9}) of a second. The photon does not belong to any of the three groups mentioned above.

When bombarding nucleons with highly energetic electrons, high pressure zones are temporarily created locally, at which the electrons will scatter. The zones can not be found with nucleons, that have not been ”bombarded”. There is no reasonable argument to elevate these zones to the rank of elementary particles called quarks.

Quarks
The explanation for the spectra of certain excited particles (including mesons and baryons) can be given by assuming that they also consist of smaller individual particles. These theoretically required particles are called quarks. In experiments thus far 5 quarks have been found which were given the names ”up”, ”down”, ”strange”, ”charmed”, and ”beauty”. It is supposed that there is another quark still, which would receive the name ”truth”. The spin of all quarks is half integral, and the charge, if it is measured in terms of an electron charge, amounts to one-third and two-thirds charges.

In order to explain the behavior of the quarks other characteristics of particles than those known, such as charge, spin and so forth, must be introduced namely ”color”. Quarks can be ”red”, ”blue”, or ”yellow”. Antiquarks can be ”anti-red”, ”anti-blue” or ”anti-yellow”. According to the quark theory only those quark combinations may exist as particles, the color of which is ”white”, and that correpsonds to certain combinations of “colors” and “anti-colors”.

Virtual Particles
The law of the conservation of energy can, according to the classical particle theory, be violated for a short time, if certain conditions are met. For example, a proton can, for a short time emit a pi+ meson and immediately capture it. One assumes, that the proton decays 1/10 of the time into neutrons and pi+ mesons. Correspondingly, one assumes that the neutron decays 1/10 of the time into a proton and pi-meson. Since pi mesons are not visible they are called virtual particles. The anomaly of the magnetic moment of neutrons and protons is explained by saying that in reality the magnetic moment of the pi-mesons is measured, which only acts 1/10 of the time, but which is, much larger due to the small mass of the pi-mesons.

”Virtual” particles are not needed either to transmit the power, since there are sufficient SQ available. And just as well gravitons, tachyons and monopoles are nothing else but fictitious, abstract, mathematical ”constructs”, which has been amply proven by the fruitless search.

A further article about elementary particles and their structure will be found in....., where the neutron will also be defined.

8.2. Photon / Neutrino

If an electron is moving, then at right angles to its direction of motion a higher pressure will be created, and behind the electron an equivalent pressure decrease will result. The pressure equalization is accomplished by the SQF_m (magnetic field).

Gravitons - Tachyons - Monopoles
Just as electromagnetic fields can be explained with the help of the wave-particle dualism, as a stream of particles of photons, thus one has also tried to do the same for the case of gravitation, for which the corresponding hypothetical particle was called graviton. But to this day it has not been found. The same fate was suffered by the tachyon, which is supposedly traveling with super light velocity and should allow travels into the past, and also the monopole, the building block of a magnet with only one pole (positive or negative), which has not been seen yet either.

Photon - Neutrino
Due to the quantizing of energy any radiation can be considered as a stream of particles. The particles are called photons. They are not particles in the classical sense, since they have no rest mass, which means they do not exist when they rest. Photons always move with the velocity of light and thus have momentum. The momentum or impulse creates a pressure when colliding with matter, which is called radiation pressure. If the atomic nucleus is instable, radioactive radiation will result. With a relative proton surplus the following happens with beta+decay: A proton changes into a neutron and ejects a positron (beta+ radiation) and a neutrino. The neutrino has neither rest mass nor charge, just as the photon. The neutrino is stable.

If the electron is accelerated, again, pressure differences will result. These will propagate as solitons perpendicular to the direction of motion with the velocity 'c', without any dispersion, and that before any pressure equalization by the SQF_m has been effected. When hitting an electron (e.g. in an antenna) then the same pressure differences will show up with the absorbing electron, just as it happened at the emitting electron. This pressure difference will equalize in the form of an impulse to the electron.

Such pressure equalization can, in principle, occur as a whole (e.g. photoelectric effect) or in part (e.g. Compton-Effect).

The reverse pressure difference originates (analogous to acceleration), if an electron is slowed down. Here also the propagation of the pressure difference continues as a soliton perpendicular to the direction of motion.

Dispersion
White light consists of all components (colors) of different wave lengths of visible light. Since these all show different signal velocities in a medium, they are also variably refracted if a light beam is sent through a prism. The result is a fan-like spreading of the light, which is called dispersion. A color band will originate, which is the spectrum with the spectral colors red, orange, yellow, green, blue, and violet.

Solitons
The life of a wave is limited by the dispersion. A wave packet consists of components with different wave lenghts. They are spreading over an ever larger area with different phase-velocities, they flatten out more and more and finally disappear entirely. A soliton, however, is not a wave packet but an individual wave (consisting of only a single half-oscillation) which does not run out but continues compact and in a straight line.

The ”photon” consists of a high pressure zone and a low pressure zone (parallel to each other), the pressures of which deviate by the same amount from the normal pressure. During propagation no oscillations occur, since the pressure difference in the soliton remains unchanged. Emission and absorption occur transverse to the direction of propagation.

”Photons”, generated when retarding an electron, have a reverse structure of those ”photons” generated during acceleration, in that the high pressure zone and the low pressure zone are reversed, thus causing a reverse impulse on the respective electron during absorption.

Photoelectric Effect
Liberating electrons by incidence of light (photon bombardment) is called photo effect or photoelectric effect or light electric effect. In the boundary layer between two different semiconductors radiation with light will free charge carriers, allowing current to be detected at the electrodes. The velocity of emitted electrons does not depend on the intensity of the light, but only on its frequency. A device which utilizes the photo effect is called a photo element. Solar cells are photo elements with high efficiency. The nuclear-photo- effect is another procedure, namely the liberation of neutrons from the atomic nucleus by energy-rich gamma radiation.

Compton - Effect
If a photon (quantum of light) hits an electron which is considered at rest, then the momentum and energy-conservation law of classical mechanics is valid. Since the electron has kinetic energy after the impulse, the photon must have given up energy. This is shown by the fact that the photon will now oscillate with a lower frequency than before the impulse, according to the wave model for light. Analogous to this its wave length does increase. This increase, however, depends strongly on the angle of dispersion of both particles, yet is independent of the frequency of the incident photon. If the photon is repelled (dispersion angle 180º), then the effect is the greatest. Proportionally, the greatest effect is obtained with photons of high frequency (x-rays).

A positron generates ”photons” when accelerated or decelerated. These photons possesss, when compared to the electron’s generation, a reverse structure having the high pressure and low pressure zones reversed.

The ”photon” therefore, is not an elementary particle, nor does it have a spin, but only shows a propagating pressure difference in a compact form (soliton).

Light Waves

Electromagnetic waves, with wave lenghts between 390 to 770 nanometers, are waves of light which is visible light. White light, as it comes from the sun or other light sources, is composed of a spectrum of all colors. Contrary to our ear, our eyes can not perceive individual wave lenghts (in sound: notes of a chord; in light colors of white light). Light shows characteristics of wave and particle, and there are phenomena, which can only be explained with waves or only with particles. This has very much confused the physicists of the 19 th century. Today this circumstance has been accepted and absorbed into the theory.

Wave - Particle -Dualism

Physics has tried to describe these events of nature with mathematical models. Physical elements are assigned to individual components of the mathematical theory. A model is good if it can describe many physical experiments precisely. Usually, for each partial field of physics there exists one model. For light, however, one model is not sufficient. In this case two models are needed which, on top of everything, are contradicting each other.The so-called dualism of particle and wave is due to the fact that certain characteristics of light (or generally of electromagnetic radiation) can only be explained by supposing that light is a wave.

An example is polarization. If two polarizing glasses (polaroids) are arranged 90º off center, and then set one behind the other, light will not pass through. The first pair of glasses cuts off all light waves except the horizontal ones which are then blocked by the second pair of glasses which had been rotated 90º. If light is declared to be particles, there is no reason why they should not pass through the glasses. The Compton-Effect and the Photo-Effect (see previous grey box), are, however, a clear proof for the particle character of light. This contradiction is something the physicists have to live with. This dualism was later also expanded to streams of particles with rest mass, that is, each particle is assigned a wave, the so-called matter wave, which completes the relationship of matter to energy.

The neutrino also, is not an elementary particle. Neither does it posses spin, but only a propagating high-pressure-only zone (anti-neutrino) in compact form (soliton), or, in the case of the neutrino, a low-pressure-only zone.

The ”wave-particle-dualism” thus is nothing more than fiction, just as the nice law of the ”conservation of the angular momentum of the spin”.

9. Atomic Nucleus - Radioactivity

The entire pressure difference between the inside pressure (low pressure) of the nucleons and the outside static medium pressure becomes effective if two or more nucleons are compressed into an atomic nucleus. The size of the nucleus is limited by the fact, the volume increases with the third power, the surface, however, only with the second power. The outside pressure only affects the surface and the inner counterpressure from the positive charges, starting with a certain size, leads to instabilities (radioactivity).

Instabilities are also originating before this, if the balance between protons and neutrons is changed.

In principle, it is impossible to build up atomic nuclei from antineutrons and antiprotons (high pressure particles).

With the expansion of the universe the SQ-density diminishes and thus the static medium pressure. Reversing the idea, one has to conclude, that in past times, SQ-density and medium pressure were higher, combined with higher gravitation and velocity ‘c’ of light. Todays stable elements will in the future become radioactive and decay, and elements that are radiactive today were formerly stable.

By decreasing the static pressure of the medium, the radioactive decay can be accelerated, respectively even stable atomic nuclei can be ”excited” to radioactive decay.

By analogy it should be possible to stabilize radioactive elements below the atomic number 82 (lead), by temporarily subjecting them to substantially higher static medium- pressure.

A detailed article about the subject of Atomic Nucleus-Radioactivity can be found.....

10. Theory of Relativity

The theory of relativity is (just as the quantum theory) a purely mathematical procedure and explains nothing at all.

According to the unified functional model, presented in this book, extremely simple explanations can be given for the matter at hand (reduction to three dimensions) without using a single abstract factor.

10.1. Time, Definition

The velocity with which all physical, chemical and biological processes occur, depends on the speed with which signals, impulses, pressure and counterpressure propagate in space, i.e., the SQ-medium. The concept of time therefore is a direct function of the signal velocity ‘c’, thus a measure for the speed of impulse transmission from SQ to SQ.

Decreased speed of impulse transmission can be noticed when chemical reactions slow down, for example instead of a sudden explosion a slow reaction taking hours. Or in the fact that a person might think, talk and move in slow motion, naturally without himself noticing this (only an observer from the outside can observe that).

10.2. Curvature of Space

The deflection of light in strong gravitational fields is caused by the gravitational pressure on the one hand and on the other by the decrease of the amplitude pressure of the SW, which corresponds to a decrease of the SQ-pressure, thus resulting in a continuous

refraction of light. To explain this very simple procedure no 4-dimensional curved space-time (mathematical fiction) is required.

10.3. Gravitation

An exact definition of this is found under the title: 11. Cosmology, Section 11.1 and 11.3

10.4. Equivalence of Gravitational (heavy) and Inertial Mass

This equivalence does not exist. Explanations under the title: 11. Cosmology, Section 11.3. (Fifth Force of Nature).

Refraction
If a plane wave enters from one medium into another, the the signal velocity, as well as its direction of propagation will change at the boundary. The beam is refracted. The angle of refraction depends on the angle of incidence and the relationship of the signal velocities in the two media.
The same is of course true for light beams. A light beam is refracted towards the normal (vertical) when entering from air into water, and this the more, the lower the angle as it hits the boundary layer.
When entering into a denser medium, the beam is refracted towards the normal. When entering into a thinner medium the beam is refracted away from the normal.

10.5. Reference Systems and Mach's Principle

The SW (standing waves) which entirely fill the space between the central oscillator and the periphery of the universe, can be considered as firm and "resting". Therefore they could be used as an absolute system of reference.

Each movement in space is acting against the resistance of the SW from which results the inertial resistance, respectively mass inertia. Explanations in the Glossary, Section 12.9, and under title 11. Cosmology, Section 11.3

Mach's Principle, according to which the inertia of a mass is caused by the effects of the rest of matter in the universe, is, to say the least, absurd.

10.6. Time Dilatation

Gravitational fields and SQ-flux hinder the signal-transmission in the SQ-medium and thus reduce the velocity of time events as follows:

1. A weakening of the SW-amplitude pressure causes a diminishing of the velocity of signal transmission, which occurs in strong gravitational fields. Explanations in Section 10.8 and 10.10. (of Chapter 10.)

2. The possibilities for motion of SQ within an SQ-flux are limited. The higher the flow velocity the more all other directions of motion of the SQ are limited and impeded. This in turn decreases the velocity of signal transmission inside an SQ-flux (SQF_t).

Explanations in the Glossary, Section 12.9

If an elementary particle would actually reach the signal velocity, then it could not pass on an impulse inside of its SQF_t. Nothing would happen which means time would stand still.

A slowing down of time (slowing down of impulse transmission from SQ to SQ) in a large space could not physically be proven any more. Only an observer outside would be able to do so by comparing it to the velocity of time events in his own locality of space.

10.7. Mass Increase and Lorentz-Contraction

The Lorentz -Contraction does not contract space, but only the particle. Explanation in the Glossary, Section 12.9

10.8. Strong Gravitational Fields

The SW amplitude pressure is lower here, and thus the signal velocity ‘c’, with no change in frequency. This results in a smaller wave length, respectively, the volume of the SW decreases, and consequently so does the volume of the elementary particle.
A lower signal velocity ‘c’ naturally causes a corresponding time dilatation.

10.9. Gamma Factor

In the same manner as an elementary particle is subject to the Lorentz-Contraction, so also does its mass inertia increase and its ‘eigenzeit’ (own time) decrease. These three factors are combined under the common concept of ”Gammafactor”, which itself is dependent on the velocity against the SW. Explanations in the Glossary, Section 12.9

10.10. Additional Remarks

It may soon be possible to either increase or decrease the time events by technical means. However, ”time travel” into the future or the past are absolutely impossible, mathematical fictions.

If the velocity of light ‘c’ decreases due to the decreasing SQ-density (expansion of the universe), then it will not be possible to determine this, since the elementary particles contract in exactly the same amount and time slows down. In principle these are the same conditions as in an strong gravitational field.

Relationship Frequency-Wavelength
A close relationship exists between frequency (f), wavelength (l) and signal velocity (c) as follows: f times l = c. From this, one can see that the frequency is inversely proportional to the wavelength, which means, the greater the frequency, the shorter the wavelength and vice versa. The concert pitch a’ has a frequency of 440 Hertz (oscillations per second). Since the velocity of sound in air at 20 degrees (Celsius) is 344 meters per second, one can calculate the wavelength: l = c/f (344 : 440) = 0.78 meter.
A high tone of 15 000 Hz (Hertz) has a correspondingly shorter wavelength, namely 2.3 cm. Looking at electromagnetic waves the conditions are somewhat different since the signal velocity amounts to 300 000 000 meter / second, which is about one million times higher. Visible light has wavelengths in the range of half a thousandths of a millimeter. Correspondingly the frequency f = c/l amounts to 600 trillion (10^{12}) Hz. In the electromagnetic range we find enormous frequencies with smallest amplitudes.

Actually time has nothing to do with space, since there is no ”4-dimensional-curved space-time”, just as there is no gravitation as a characteristic of space.

The signal velocity ‘c’ is not a universal constant, but depends on the SQ-density, the SW-amplitude pressure, on the velocity of elementary particles against the SW and on the distance from the central oscillator.

The basis for the theory of relativity are in part arbitrary assumptions and can easily be refuted with the theory presented here.

As can be gleaned from the explanations thus far, the foundation of the theory of relativity is ”shaking” quite seriously. Actually, there is not much of it left....

11. Cosmology

11.1. Gravitation

Every elementary particle represents a resistance which, even though very slightly, resists the propagation of the SW. Every accumulation of matter (e.g. a planet) weakens the amplitude pressure of that component of the SW, which has to penetrate all of the matter, as opposed to the wave coming from the outside which has not been weakened. The amplitude pressure-difference superimposes on the SW in the form of a progressive wave coming from the outside excerting a pressure on the mass, namely the gravitational pressure.

Let it be mentioned here again, that gravitation is possible only, if the amplitude pressure of the progressive wave (which by interference create SW), are greater than than the static SQ-medium pressure. Only in this case will the effect of the high pressure zone (impulse in the direction of propagation) be greater than in the low pressure phase (impulse in the opposite direction). As already mentioned in Chapter 3, this asymmetry results because the amplitude pressure in the low pressure phase can only reach the value of zero, however, in the high pressure phase it can reach any value. The negative half-wave therefore possesses a smaller amplitude than the positive half-wave.

If, however, the amplitude pressure of the progressive wave would be smaller than the static SQ-medium pressure, then the effect of every high pressure phase (impulse in the direction of propagation) would be compensated by an exactly corresponding low pressure phase (impulse in the opposite direction).

Gravitation therefore does not cause an ”attraction” between two masses, but a mutual pressure of thrust (push). Earth is not ”attracting ” us, but instead, we are pressed down by pressure from the outside.

11.2. Space-Quanta-Structure

Even SQ (space quanta) surely are not elementary. By analogy to the electrically neutral atoms, our matter (consisting of positive nucleus and negative electron shell), they are the neutral atoms of a primordial-quanta-medium. These primordial quanta are magnitudes of order smaller than the SQ. The primordial-quanta-medium also possesses a central oscillator, which has a higher oscillation frequency. The density of of the primordial-quanta-medium, as well as pressure and signal velocity are also by magnitudes of order higher than our SQ medium. This other central oscillator is far removed from our universe located in the center of the primordial-quanta-universe.

By analogy to our elementary particles, there are correspondences in the primordial quanta medium in the form of primordial-quanta-protons and primordial quanta-electrons of which the neutral SQ exist. These primordial-elementary particles (consisting of primordial quanta) can only exist inside of SW of the primordial-quanta-medium and require a steady supply of energy. In principle, the same procedure takes place as with the elementary particles of our matter in the SQ-medium but on a lower level. The gravitational actions are also analogous.

The basis for the surety of this statement can again be found in the unified functional model. There absolutely exists this only one possibility.

11.3. Gravitation and Inertial Mass in the Primordial-Quanta-Medium: Fifth Force

A certain portion of gravitation, as well as of mass inertia, goes back to the SW of the primordial-quanta-medium (PQ-medium). For this reason there is no equivalence between gravitational and inertial mass.

All SQ are influenced by the gravitational pressure of the primordial-quanta-medium and pushed against each other (mutual ”attraction”). A single SQ (space quanta) thus has a definite, specific weight in the primordial-quanta-medium. The more SQ are contained in a specific unit volume, the greater will be the PQ-medium gravitational pressure on this unit volume.

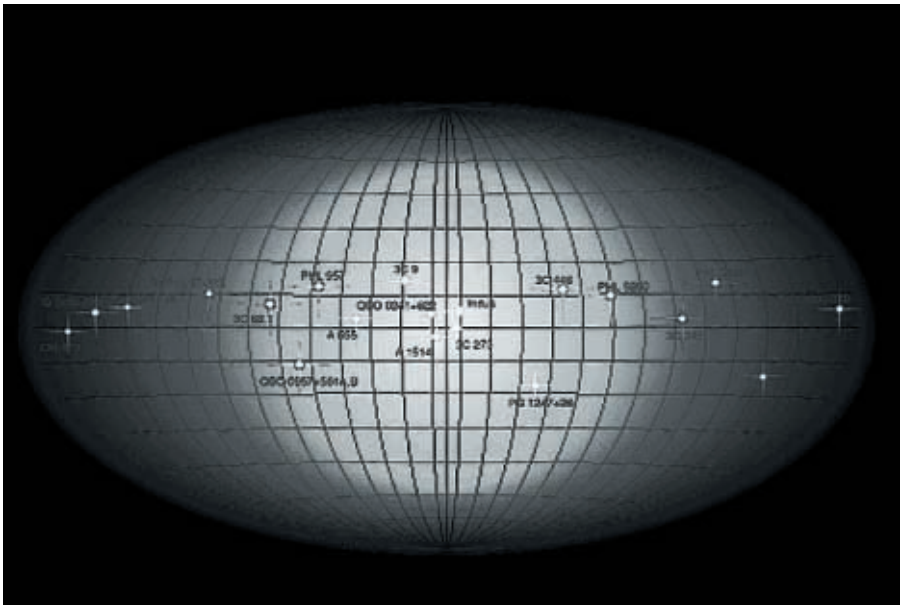
As a low pressure-particle, every nucleon is a volume with less SQ. The individual SQ are now further apart and thus among them there will be a decrease of the gravitational pressure of the primordial-quanta-medium (PQ-gravitation). On a nucleon therefore a weaker PQ-gravitational-pressure will act then on the same volume with normal SQ-density (SQ-density of the vacuum). On high pressure particles (antiproton, antineutron, electron) however, a stronger PQ-gravitational pressure will act than on the same volume with normal SQ-density.

The ”empty space” (i.e. the vacuum) with its high SQ density therefore has a higher specific density than our matter, when considering the PQ-gravitation. Nucleons, in the SQ-medium, therefore, are additionally subject to buoyancy in the direction of the SQ-pressure decrease (which applies in the direction of earth), according to their SQ-displacement, which partly compensates the diminished PQ-gravitational pressure. Without this buoancy, the gravitational effect of matter would be much smaller.

The greater and denser a nucleon mass is, the greater will be the SQ-gravitational pressure and thus the more will the PQ-gravitational pressure be reduced. The same is of course true for an entire planet such as earth. Between masses of high nucleon density and the earth there exists a lower ”attraction” than with masses of smaller nucleon density.

Cores of galaxies do not consist of elementary particles any more, but only of SQ. PQ-gravitation keeps galaxies together.

Mass inertia consists of two components, namely the resistance which originates from the acceleration of elementary particles against the SW of the SQ-medium, and of the resistance which results from the acceleration of the SQ contained in the elementary particles against the SW of the PQ-medium. This causes a smaller mass inertia with low pressure particles (proton, neutron, positron) than with the high pressure particles (antinucleon, electron).



Universe and Central Oscillator

The known universe is here represented as egg-shaped. The greatest expanse amounts to about 40 billion (10^9) light years from the extreme left to the extreme right edge. The central oscillator, for better clarity shown in yellow, is in reality translucent. Our milky way, as a part of our local super cluster, is found approximately in the center of the picture.

Two similar tantric pictures from Kangra, in the State of Himachal Pradesch, NW India, can be found in Paris. (Reunion des Musees Nationaux).

Source: Unesco-Courier No. 9/1984.

11.4. Origin of the Universe, with Central Oscillator

Our universe by itself is a closed unit, however, it is only an extremely small part of a higher level primordial quanta-universe, in which there are inumerable numbers of like SQ-universes, which all originated at the same time as did our universe.

In a relatively large area of space any present SQ were acted upon by the gravitational pressure of the primordial-quanta-medium (PQ-gravitation) and pushed against the center of this SQ area. That was the beginning of our universe. Already at the beginning, out of the primordial quanta and the SW (standing waves) of the primordial-quanta-medium, a spin impulse was imparted to the SQ-medium. The rotational velocity of the affected SQ-area increased with increasing compression.

Parallel to the compression of the SQ-medium, the resistance for the SW of the primordial quanta medium became increasingly greater, which caused a corresponding weakening of the amplitude pressure. The primordial-elementary particles (of which the SQ consist) thus had a higher pressure compared to the SW of the primordial quanta medium which was compensated for by giving up primordial-quanta. In the reverse case, that is with expansion of the SQ-medium, the resistance for SW of the primordial quanta medium becomes smaller and the amplitude pressure higher. Primordial-elementary particles now have, compared to the SW of the primordial-elementary medium, a low pressure, which is compensated for by taking up primordial quanta.

With increasing compression the gravitational pressure on the SQ-medium increased continually. In the first compression phase an enormous volume-reduction was achieved, which caused the giving off of a tremendous amount of primordial quanta, which created a certain counterpressure. In this way, together with the centrifugal force, a gigantic pressure potential was built up until the contraction ended.

The first compression phase generated a high density core zone which expanded again. This caused a pressure wave-impulse which hit the collapsing SQ-medium and together with it created a high density SQ-hollow sphere, which again expanded by the emission of primordial quanta. This expansion was directed outward and created another SQ-hollow sphere in like manner. This process repeated until the expansion pressure became too low (caused by the increasing surface area of the sphere) while at the same time decreasing the density of the collapsing SQ-medium.

The gravitational pressure of the primordial-quanta-medium affects each of these highly dense SQ-hollow spheres from the inside and the outside. Every hollow sphere then oscillated on its own and compressed itself further, according to the steadily increasing gravitational pressure. A space free of SQ formed among the individual hollow spheres in the course of time. Only the innermost core is a solid sphere. The thickness of the wall of the hollow spheres decreases form the center to the outside.

The outermost hollow sphere is subject to the greatest gravitational pressure, and possesses the greatest SQ-density and the highest signal velocity (‘c’ being many orders of magnitude higher). It has the smallest wall thickness and oscillates the fastest (x 10^{23} Hz).

The surface of this outermost hollow sphere, being a spherical oscillator of zero order, transmits longitudinal oscillations to the adjacent SQ-medium (which practically is the atmosphere of the central oscillator), and which are reflected at the periphery of the universe, then return and thus form the SW in our SQ-medium.

Every hollow sphere of the central oscillator oscillates with its own specific frequency and periodically emits, respectively absorbs, large amounts of primordial-quanta. This causes a mutual influence of all hollow spheres of the central oscillator. At great intervals simultaneous transmissions of primordial-quanta of several hollow spheres take place. This subjects the outer SQ-hollow sphere to such strong pressure from the emitted primordial-quanta that an explosive ejection of large amounts of high density SQ results. They mostly originate from the equator plane of the central oscillator (SQ-eruption).

The ejected SQ-space areas are extremely dense (according to the primordial-quanta-gravitational pressure at the surface of the central oscillator) and expand first under strongly weakened PQ-gravitational pressure. Then the SQ-space area contracts again (now on its own and under its own PQ-gravitational pressure) which is followed by the construction of a miniature edition of the central oscillator, which is equivalent to a galaxy cluster core.

Analogous to the central oscillator here also eruptions of highly dense SQ-space areas occur, which now correspond to the galaxy cores. These also first expand and then contract again. Then follows the construction of a super-miniature-edition of the central oscillator, which will not be able any longer to eject condensed SQ-substances.

The origin of the universe was in principle completed, when all SQ were affected by the gravitational pressure of the primordial quanta medium and had been pushed far enough towards the center, so that the counter pressure of the SQ ended this process. This was due to extremely high pressure conditions (e.g. in the central oscillator) and the strongly degenerated SQ-medium in the form of totally disassociated SQ (as SQ-plasma). The central oscillator stabilized its oscillation frequency and its oscillation amplitude. Between the central oscillator and the periphery of the SQ-universe is found the SQ-medium as atmosphere of the central oscillator, steadily decreasing in density, with its numerous galaxies and stars.

One should have clearly in mind, that these events take place in the primordial quanta medium, for the central oscillator consists solely of SQ, respectively of SQ-disassociation-products (pimordial-nucleons, primordial-electrons). The entire energy of our central oscillator and thus the entire energy of the universe comes from the primordial quanta medium.

11.5. Origin of Matter

Galaxy-cores are by many orders of magnitude smaller, miniature versions of the central oscillator. Corresponding to their much smaller volume, their SQ-density, as well as their oscillation frequency, and the amplitude pressure are also much smaller by many orders of magnitude.

A prerequisite for forming elementary particles was the existence of SW in the SQ-medium. These had already formed long before the existence of the galaxy cores. Due to the much higher signal velocity ‘c’ inside the highly dense galaxy cores (at the same frequency),

much higher dimensions for the SW resulted, with less energy, relating to the unit volume.

The static SQ-medium pressure inside a highly dense galaxy core is now very high compared to the amplitude pressure of the SW (of the SQ-medium) so that the high pressure of the SW is insufficient for any synthesis of antiprotons. However, the high pressure for the synthesis of electrons is more than sufficient, which provides them additionally with a very high kinetic energy. A galaxy-core can easily reach the low pressure required for the synthesis of protons with its own oscillation. Even inside a galaxy-core the lightest elements, such as helium, can be formed already.

The ejection of matter occurs mostly through the two poles in form of jets, since the specific weight of the nucleons is much smaller than the corresponding volume of the SQ-medium.

11.6. Sun Energy

The sun produces radial oscillations by expanding within 2 hours and 40 minutes by 3 km (radius) and then ”contracts” again.

Additionally, the entire surface of the sun oscillates with a 5-minute rhythm and an outward-directed velocity of 300 meters per second, after which it falls back again. Analogous to the structure of the central oscillator, the sun also consists of several nested hollow spheres. Only the innermost sphere is solid.

In contrast to the central oscillator these hollow spheres do not consist of dense SQ but out of normal dense matter. The outermost hollow sphere has the greatest density (caused by the greatest

gravitational pressure), as well as the highest oscillation frequency of 5 minutes.

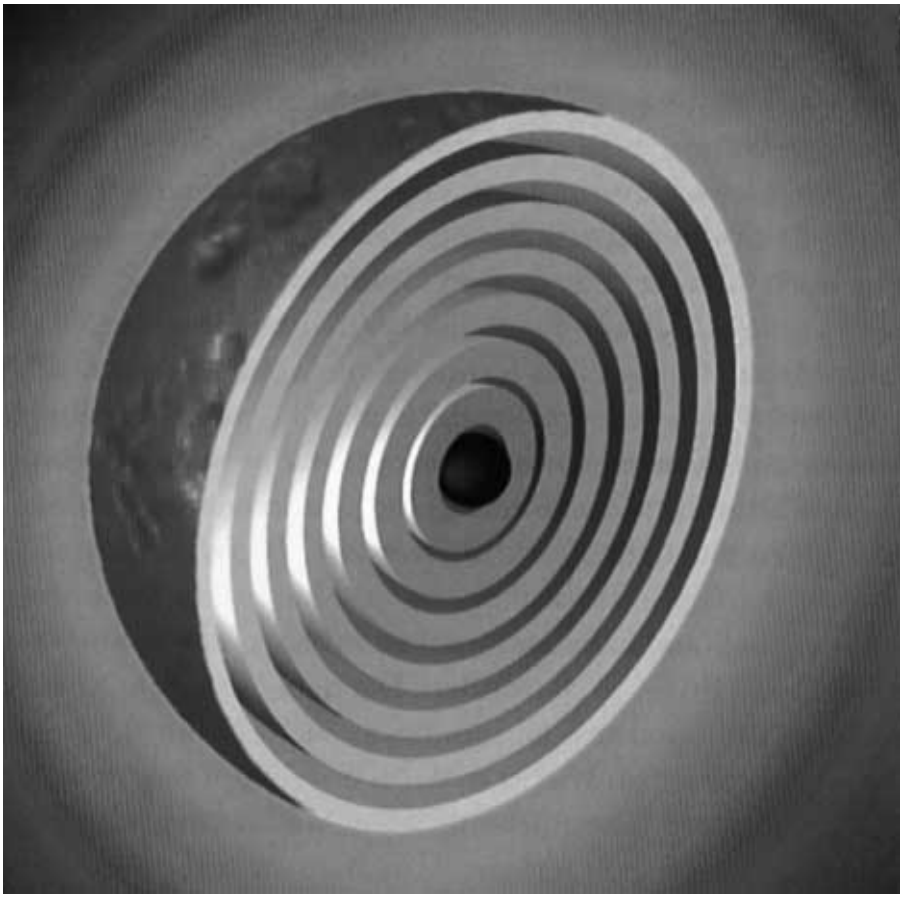
The pulsations (or oscillations) are caused by emission, respectively absorption, of SQ by the elementary particles, and also by the gravitational pressure, analogous to the events in the central oscillator. The great pulsation-rhythm of 160 minutes comes about by the combined effects of all hollow sphere-oscillators of the sun with all their different frequencies.

Structure of the Sun-Atmosphere
The sun-atmosphere is the only thing that we can see of the sun. It has a temperature of about 6000 degrees Celsius and is layered from the inside to the outside consisting of the photosphere, the chromosphere, and the corona. The 400 km thick photosphere or light-envelope constitutes that part of the sun's surface which is visible to us, with the sun spots, prominences and flares. The corona can be visible at total solar eclipses and is the brightly lit surrounding of the sun being about as bright as the full moon. The corona is heated up by impulse waves to an average of 1 million degrees Celsius. The outer edge of the corona forms the transition to interplanetary matter.

By analogy to the central oscillator, in the sun also each hollow sphere oscillates with its own specific frequency and emits, respectively absorbs, enormous amounts of SQ which causes a mutual influence of all hollow spheres. Here also at great intervals of time simultaneous SQ-emissions of several hollow spheres take place, which can so raise the sun activity that eruptions of the size of entire planets are possible. The planets of our system were thus ejected in this manner from the sun.

In the future also, there are to be expected surprising activities of our sun. The climatic conditions on the earth were and are practically determined by the activity of the sun alone and only to the smallest degree by man. The knowledge of the pulsation-rhythm of the individual hollow spheres of the sun would make it possible to calculate the future of our planet.

The periodic compression (by gravitation) and expansion (caused by emission of SQ) creates a plasma in the sun. The required condition is, that the average free path is sufficiently large, which is the case for the atmosphere of the sun. The temperature of this atmosphere increases steadily going outward, while the atmospheric pressure decreases: Photosphere 5700º C, chromosphere up to 100 000º C, corona partially to 5 million degrees Celsius. Almost the entire radiation energy of the sun is generated by the gravitational pressure. Only a small fraction of the energy comes from nuclear fusion, which was confirmed by neutrino-measurements (only 27% of the calculated amount).



Our Sun

Cross section of our sun, based on the theory of O. Crane.
We see several hollow spheres with decreasing wall thickness from the inside to the outside. Only in the center is found a solid sphere.

If the sun spot-relative number is plotted against the measured neutrino flux, then, an anticorrelation results, having considered the average value of statistical fluctuations. In 1980 at a sun spot maximum the measured neutrino flux was extremely low. In 1986 at a consequent low sun spot minimum, the neutrino flux was rather high. (Source: Stars and Space 1/92).

Should the sun indeed in some miraculous manner accomplish this trick to always reduce its energy production to a minimum just when a maximum of energy is radiated and always produce a maximum of energy, just when a minimum is radiated?

According to the ”standard model” nuclear processes are supposed to take place in the core of the sun. The energy thus generated takes millions of years to travel to the surface of the sun. How is it even possible that a momentary surface activity of the sun has a determining influence of the events in the innermost core? Or might it even be the opposite?

According to the unified theory (here presented) the strongest gravitational pressure affects the outermost hollow sphere of the sun.

Plasma
The required high temperatures for nuclear fusion (fusing two atomic nuclei), necessitates kinetic energy (energy of motion) which due to thermal motion is essentially higher than the binding energy between the electrons and the nucleus of the light atoms. This causes the electrons to be loosed from the nuclei (ionization) and the entire matter consists of a mixture of free atomic nuclei and free electrons. A gas thus fully ionized is called a plasma. Even nuclei can now collide since they have lost the protecting electron shell.

Consequently here pressure and density are the highest and only here can thermonuclear reactions take place. However, pressure and temperature are still quite lower than they have been calculated for the core of the sun. Therefore correspondingly less thermonuclear reactions take place, which also causes a considerably smaller neutrino flux.

At the time of a sun spot maximum additional SQ-emission takes place in the inner hollow sphere-oscillators of the sun. These SQ penetrate the outer hollow sphere and generate strong flows which lead to sun spots and eruptions. This flow also influences the motion of highly heated gases which take part in thermonuclear reactions and thus lead to a much smaller reaction yield and less neutrinos.

11.7 Additional Remarks

The atmosphere of the central oscillator (namely the SQ-medium, in which we live) also has its own, extremely low pulsation period, which is due to the tremendous distances which have to be covered in each pulsation period. This expansion and contraction is completely independent of the fact whether our matter (and thus we ourselves) exist here or not. We presently are in an expansion phase of this SQ-atmosphere caused by the emission of primordial-quanta.

To this day it has not been found out where the energy for a supernova comes from. In computer simulations an implosion of a star happens at the end of its development, but no sequential supernova explosion takes place.

Here again, the explanation according to the unified theory is simple: Due to the extreme explosion a very intensive emission of SQ results which come from all elementary particles involved (in analogy to the

sun-pulsation), and that causes the supernova explosion.

The problem of galaxies rotating too fast does not come up, if one considers, that between the outer regions rotating too fast and the central core, the entire space volume is filled with the SQ-medium which increases in density towards the core. This tremendous mass of SQ generates the additional ”attraction”-force required at exactly the right place.

In the realm of the PQ-gravitation, the ”attraction” of a SQ-galaxy-core for the matter found in the galaxy is strongly diminished due to the fact that the nucleons contain essentially less SQ than a comparable volume of ”empty” space (SQ-density of the vacuum).

Additionally, nucleons, according to their SQ-displacement, are subject to a buoyancy in the direction of the SQ-pressure decrease, that is in the direction of the galaxy periphery (away from the galaxy core).

Doppler Effect
If there is a relative motion between a source of sound (sender) and the receiver, that is to say if their distance is either increased or decreased, then the receiver detects a different frequency than the sender had transmitted (e.g. passing police car with running siren). If the sender moves towards the receiver, then this corresponds to a shortening of the wave length and thus a corresponding increase of the frequency. If the sender travels away from the receiver, then this corresponds to an increase of the wave length and a corresponding decrease of the frequency. This is also the case with the known red shift of spectral lines of light from galaxies, which, due to the expansion of the universe continually move away from us. At the approach of stars however, a blue shift (shorter wave length) would take place.

Besides this, there is the centrifugal force (against the SW of the SQ-medium), as well as the centrifugal force of the SQ contained in the nucleons (against the PQ-medium).

As is known, there is no explanation for cohesion of giant structures (galaxies, galaxy-clusters and galaxy-super-clusters) using ”luminous matter”. The SQ-galaxy cores and cluster cores, as well as the central oscillator, are optically invisible. Galaxy cores can only be made noticeable indirectly by emission of matter and PQ-gravitational effects.

The distribution of matter in the universe (on the surface of big bubbles) now becomes easily understood. This also solves the problem of the ”missing” (gravitational) masses.

The normal SQ-gravitation (according to Newton) plays a modest minor part in our universe. It causes (in addition to the PQ-gravitation) the cohesion of solar systems with their planets, as well as the mutual ”attraction” of suns inside a galaxy. All other items are carried out by the PQ-gravitation.

Black Holes: A very extreme density of elementary particles represents a great resistance for the propagation of the SW in the SQ-medium weakening them so much that the amplitude pressure in the SW drops to the static medium-pressure. This makes it impossible for an internal SW total reflection (as described under 8.1. Structure of Elementary Particles) of condensed, respectively rarefied SQ-zones. The elementary particles completely decay into SQ. But even long before, the gravitational pressure continually weakens since it is due to the asymmetry between the positive and negative half-wave. (As described under 11.1 Gravitation).

Black holes are, regrettably, just as impossible, abstract mathematical fictions, as the nice hypothesis of the ”big bang”, according to which originally there were parity relations between matter and antimatter. For unexplainable reasons a part of the matter survived the subsequent pair-annihilation. Besides this, the ”big bang” does not give the tiniest indication how the elementary particles (as smallest units of matter) even originated.

The exact measurement of the cosmic background radiation (1978) at 18 km altitude lead to the result, that the whole Virgo-Super-Galaxy Cluster (to which our local group of the Milky Way-Galaxy, including our solar system belongs), is moving to the constellation of lion (the star Regulus) with a velocity of 600 km per second. (Source: Hans J. Störig, ”Knaurs Modern Astronomy”, 1983). According to this, the central oscillator should be found in that region.

Black Holes
Black holes originate because of the collapse of heavy stars. If a heavy star burns out completely, meaning the nuclear fusion inside the star comes to a halt, then the balance between the radiation pressure directed outward and the gravitational pressure directed inward is disturbed and the star collapses. In some stars this goes so far that not even a beam of light can escape, since the photons with their moving mass are strongly attracted. There is a limit, the so-called Schwarzschild-Radius, inside of which nothing can escape any more.
After surpassing the Schwarzschild-Radius, gravitation increases (according to establishment physics) to infinity and the matter affected gains infinite density, being squashed to zero volume. But, up to now, there are only suppositions about black holes, as well as hypotheses and speculations, according to the principle: ”Everything goes, which is not strictly forbidden.” But science still owes the undisputable proof to this day.

The entire SQ-medium is compressed by the PQ-gravitation pressure in the direction of the central oscillator. The amplitude pressure of the SW is highest close to the central oscillator and decreases with the square of the distance. If the amplitude pressure, however, goes above the static medium pressure, which, in an extreme manner is the case in the entire atmosphere of the central oscillator, respectively in the SQ-medium, then the signal velocity 'c' becomes dependent on the amplitude pressure.

In the direction of the central oscillator the velocity 'c' of light increases by orders of magnitude, as well as the energy of the SW. Thus most physical constants of nature change proportionally with the distance and are therefore only valid in the local area.

Amplitude Pressure-Decrease in the Propagation of a Mechanical, Spherical Wave

A spherical oscillator of a certain diameter generates a spreading, spherical wave on its surface with a certain amplitude pressure. If the propagating spherical wave reaches the double diameter of the spherical oscillator, then the initial energy distributes over a fourfold spherical surface and the amplitude pressure has dropped to a quarter of the original value. Amplitude pressure therefore decreases quadratically with the distance.

This makes invalid all astronomical calculations of distance (outside of our solar system) as well as other measured astrophysical quantities. The actual distances are by magnitudes of order higher and thus also the size of observed stars, as well as the strength of their light.

A further result is, that the age of our SQ-universe is also by magnitudes of order higher, since the observations and theories of cosmologists only relate to the present expansion phase of the SQ-atmosphere of the central oscillator. Besides this, the arbitrary assumption is made, that the velocity of light is constant for the entire universe.
A further result is, that the age of our SQ-universe is also by magni-

12. Glossary

12.1. Space-Quanta (SQ)

The entire universe consists of an ideal gas (strongly degenerated within high density zones). This gas consists of uniform particles, the ”space-quanta” (SQ). The volume of these SQ is, compared to the elementary particles, by many magnitudes of order smaller. All elementary particles and force fields are made up out of these SQ. Explanations under title: 11. Cosmology, Section 11.2, as well under title: 3. Foundational Prerequisites.

12.2. Primordial-Quanta (PQ)

SQ are not yet elementary, but still consist of considerably smaller primordial-quanta, which make up the PQ-medium. Explanation under title: 11. Cosmology, Section 11.3

12.3. Central Oscillator

This produces, as a spherical radiator of zero order, mechanical, longitudinal waves, which propagate in the SQ-medium. They are reflected at the periphery of the universe, then run back again, thus creating SW in the entire space. Explanations under 3. Foundational Prerequisites and 11. Cosmology, Section 11.5

12.4. Standing Waves (SW)

Standing waves result from interference between two coherent waves opposing each other, which have the same frequency and

amplitude. The energy of the SW remains in its place. Explanations under: 3. Foundational Prerequisites

12.5. SQ-Gravitation

This acts upon matter, respectively on elementary particles. It is identical with Newton's gravitation. Explanations under: 11. Cosmology, Section11.1

12.6. PQ-Gravitation

This acts on the SQ and effects the cohesion of galaxies, galaxy clusters and galaxy-super clusters. Explanations under: 11. Cosmology, Section 11.3

12.7. Space-Quanta-Flux (SQF)

Each SQF compensates pressure differences and stores its energy. Basically, however, there are two different types of SQF:

12.8. SQF_m, identical with the Magnetic Field

The SQF_m equalizes pressure differences, which have been created by electric charges. The SQF_m (magnetic field) is spread out widely and relatively energy-poor as compared to the highly condensed SQF_t. Detailed explanations under title: 6. Definition of the Magnetic Field.

12.9. SQF_t, identical with ”Matter Waves” and Mass Inertia

The SQF_t equalizes pressure differences which are caused by all elementary particles during any motion against the SW. The position of SW can be considered as fixed and unchangeable, for which reason it could be used as an absolute reference system.

A non-moving, elementary particle is subject to the same pressure from all directions (Fig.18a.) If the particle begins moving (against the SW) then a higher pressure is created at its front and behind it an equivalent low pressure. The work needed to create this pressure difference corresponds to inertial resistance.

The SQF_t provides the pressure equalization. At the front and the back of the particle two equal, compressed SQ-zones will originate (pressure point). A stationary flux has formed around the particle, in which is contained the energy that was previously expended. The particle is now moving uniformly straight. (Fig.18b.). If the motion of the particle is stopped the reverse pressure difference will be created. The front pressure point will be relieved and the back pressure point gives up its energy in form of an impulse back to the particle, which corresponds to the mass inertia.

Any deviation from the uniform, straight-line motion is directed against the resistance of the SW and builds up SQF_t, respectively, converts flow energy into an impulse to the particular particle.

The centrifugal force and the stability of a rotating gyroscope (or top) are based on these simple principles.

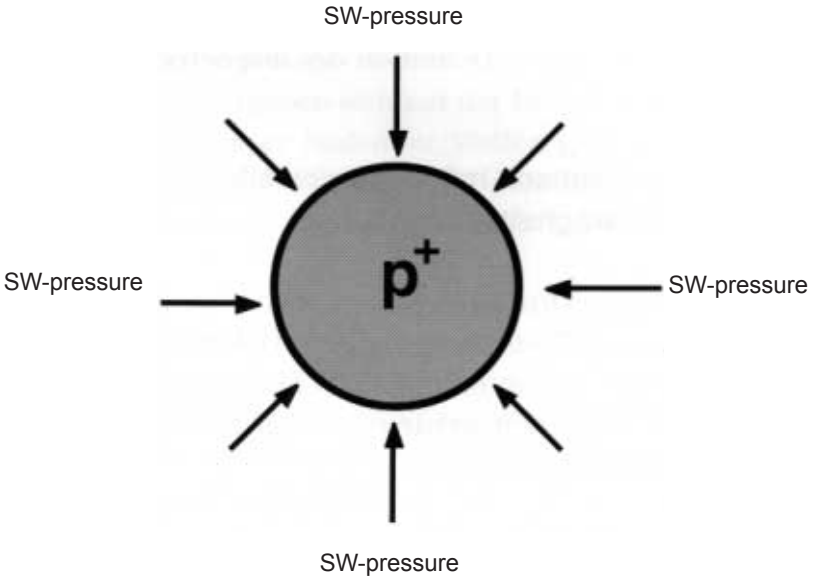


Fig 18a. Non-moving elementary particle (proton)

The SQF_t is highly condensed and inseparably connected with the elementary particles.
At right angles to the direction of flux the pressure decreases (Bernoulli-Principle); the higher the flow velocity, the lower the pressure. This, however, causes a certain contraction of the flow. Thus the expansion of the SQF_t depends on the velocity of the particle. A greater particle mass, or greater particle velocity, cause a greater dynamic pressure at the SW and thus create a higher flow velocity, which again causes a greater flow-contraction. The SQF_t is therefore identical with matter waves.

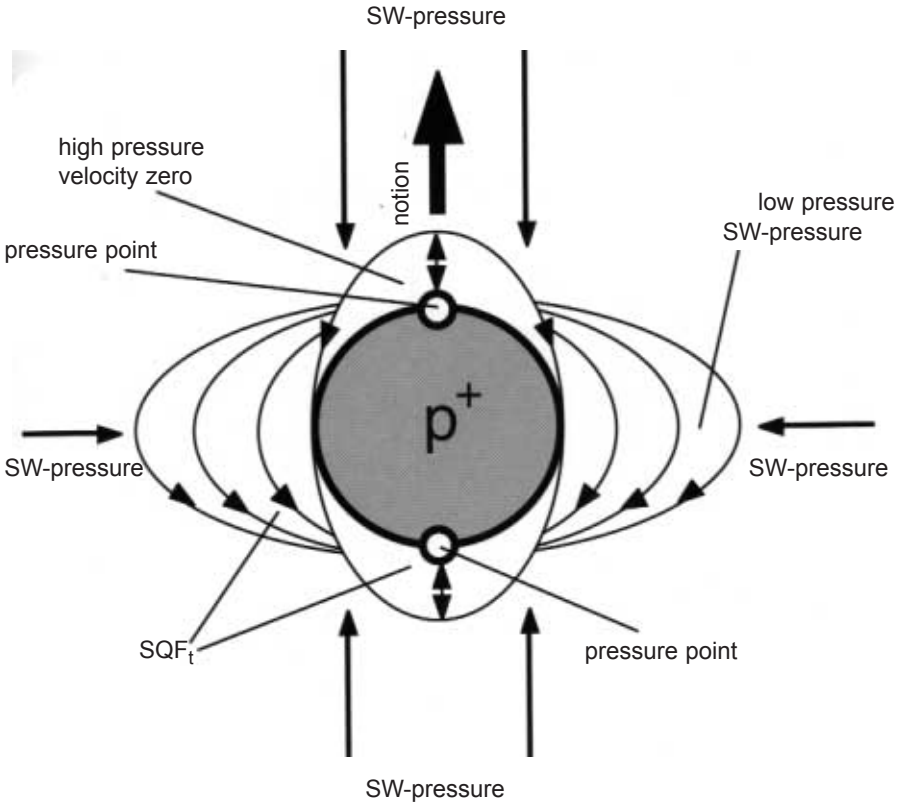
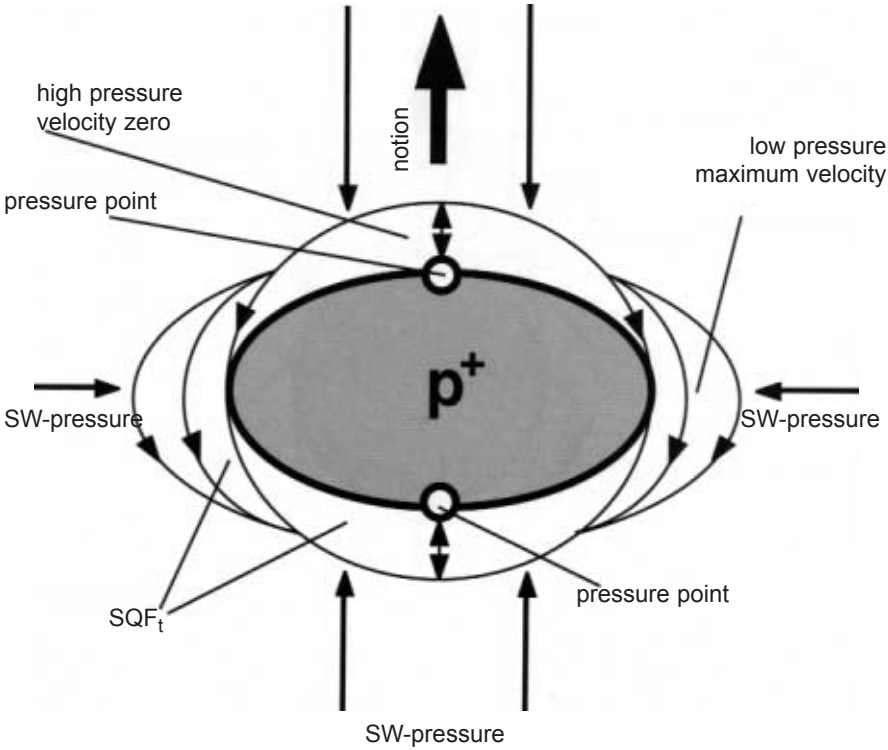


Fig. 18b. Uniform-straight motion of elementary particle (proton).

The pressure point at the front of the moving particle consists of a compressed zone of SQ which exerts the same pressure on the particle as on the SW. The same pressure is also exerted on the particle from the rear pressure point.



Between these pressure points the elementary particle is compressed at high velocity, which corresponds to the Lorentz-FitzGerald Contraction (Fig.19).

When approaching the velocity of light ‘c’, the dynamic pressure at the SW increases tremendously, because the difference between the velocity of the particle and that of the SW, which pulsate with the velocity ‘c’, is soon diminished. This allows the tremendous pressu-

of the SW to slowly be transferred to the elementary particle, which then leads to an extreme rise of the SQ-flow velocity.

However, this does not cause a mass increase of the particle. The rest mass remains unchanged, only the kinetic energy is increased proportionally. The appearing time-dilatation is caused by the fact that, time is identical with the velocity of transmission of signals and impulses from SQ to SQ. The greater the velocity of the SQ, the stronger will all other motion possibilities of individual SQ be narrowed down. This explains the relativistic behavior.

Lorentz-Contraction explains Michelson-Morley-Experiment
Using a very clever, world renowned experiment, Michelson and Morley in 1886 measured time differences in the travel of light beams, in order to determine the absolute velocity of earth with respect to absolute space. This was done by using a semi-transparent mirror to measure the time differentials of light beams which propagate in different spatial directions. To their disappointment they found nothing. Even minute deviations should have become visible as interference-patterns. Light had ”failed”, but there had to be an explanation for this. Many explanations were given:
a) wrong experiment (Kelvin); b) earth is the center of the universe; c) earth carries ether along with it in immediate vicinity (Stokes); d) the apparatus was shortened in the direction of motion (Lorentz); e) there is no ether (Mach); f) addition theorem not valid for light, velocity of light independent of the observer, meaning, ether can not be proven (Einstein).
It has been shown, that d) can explain the phenomenon. This explanation means, that matter shortens in the direction of motion. If, in so doing one does not want to throw out physical laws of motion, it follows, that clocks which travel run slower. This effect is very small at low velocities, but was clearly proven with highly precise clocks in airplanes. At very high velocities, as for example, are achieved in modern elementary particle-accelerators, these effects are quite obvious and extremely noticeable. Einstein used the idea of Lorentz in his theory of relativity, yet in his space-time-formalism (4-dimensional curved space-time) he does not need the length-contraction.

12.10. Physical Concepts (A-W)

Remarks: Physical concepts are explained for the non-physicist in separate boxes. These explanations of physical facts are according the the present state of school physics. The new, uniform theory, must, of necessity, for some facts, give explanations which differ slightly, otherwise it would not be anything else but an identical edition of school physics.

Repulsion of Opposite Flows

In oppositely directed flows, particles in the boundary layers of the two flows hit each other slightly out of line (such as two billiard balls in a non-centered stroke). Thus the particles sustain an impulse which drives them apart. Oppositely directed streams can therefore not mix and will push each other aside. (repulsion).

Amplitude - Displacement

The amplitude is the greatest shift of the exciting oscillation of a wave. The displacement is the momentary shift of a particle from its position of rest, which is the solution of the wave equation which reads:
Displacement = amplitude times SIN (2 times p times frequency times [time - distance / signal velocity]).

The distance (path traversed) is the separation from the center of excitation. If we are at a crest, the displacement is maximum and equal to the amplitude. For electromagnetic waves analogous equations hold true for voltage, current, the electric and magnetic field.

Amplitude Pressure-Decrease in the Propagation of a Mechanical, Spherical Wave

A spherical oscillator of a certain diameter generates a spreading, spherical wave on its surface with a certain amplitude pressure. If the propagating spherical wave reaches the double diameter of the spherical oscillator, then the initial energy distributes over a fourfold spherical surface and the amplitude pressure has dropped to a quarter of the original value. Amplitude pressure therefore decreases quadratically with the distance.

Relationship Frequency - Oscillation Energy

Energy is transported in every wave as oscillation energy, which is passed on from particle to particle of the medium. Standing waves are an exception, the energy of which remains in the same place and is not transported. At the zero point a particle has maximum velocity and maximum kinetic energy. At the valley (return point it has no velocity, but maximum potential energy, which is porportional to the square of the amplitude. This means if the amplitude (loudness or volume in acoustics) is doubled, the energy will increase fourfold.

If the energy for a small unit volume is calculated, which is the energy density, then it is found that it also is proportional to the frequency of a wave. If therefore the frequency of a wave is doubled, keeping the same amplitude (in acoustics this means one octave higher), then the energy density increases fourfold.

Relationship Frequency - Wavelength

A close relationship exists between frequency (f), wavelength (l) and signal velocity (c) as follows: f times l = c. From this, one can see that the frequency is inversely proportional to the wavelength, which means, the greater the frequency, the shorter the wavelength and vice versa. The concert pitch a' has a frequency of 440 Hertz (oscillations per second). Since the velocity of sound in air at 20 degrees (Celsius) is 344 meters per second, one can calculate the wavelength: l = c/f (344 : 440) = 0.78 meter. A high tone of 15 000 Hz (Hertz) has a correspondingly shorter wavelength, namely 2.3 cm.

Looking at electromagnetic waves the conditions are somewhat different since the signal velocity amounts to 300 000 000 meter / second, which is about one million times higher. Visible light has wavelengths in the range of half a thousandths of a millimeter. Correspondingly the frequency f = c/l amounts to 600 trillion (10^{12}) Hz. In the electromagnetic range we find enormous frequencies with smallest amplitudes.

Refraction

If a plane wave enters from one medium into another, the the signal velocity, as well as its direction of propagation will change at the boundary. The beam is refracted. The angle of refraction depends on the angle of incidence and the relationship of the signal velocities in the two media.

The same is of course true for light beams. A light beam is refracted towards the normal (vertical) when entering from air into water, and this the more, the lower the angle as it hits the boundary layer.

When entering into a denser medium, the beam is refracted towards the normal. When entering into a thinner medium the beam is refracted away from the normal.

Compton - Effect

If a photon (quantum of light) hits an electron which is considered at rest, then the momentum and energy-conservation law of classical mechanics is valid. Since the electron has kinetic energy after the impulse, the photon must have given up energy. This is shown by the fact that the photon will now oscillate with a lower frequency than before the impulse, according to the wave model for light. Analogous to this its wave length does increase. This increase, however, depends strongly on the angle of dispersion of both particles, yet is independent of the frequency of the incident photon. If the photon is repelled (dispersion angle 180º), then the effect is the greatest. Proportionally, the greatest effect is obtained with photons of high frequency (x-rays).

Dielectric

A dielectric is a non-conducting substance, which is placed between two oppositely charged plates (for instance in a plate condenser).This changes the field strength between the plates. The type of change is described by a characteristic of the dielectric, called permittivity (dielectric coefficient). Vacuum and air have a minimum permittivity of one (1). Water has the highest permittivity (about 80). [A $BaTiO_3$ crystal can have a value of 2000, if the electric field is perpendicular to the principal axis of the crystal].

Dispersion

White light consists of all components (colors) of different wave lengths of visible light. Since these all show different signal velocities in a medium, they are also variably refracted if a light beam is sent through a prism. The result is a fan-like spreading of the light, which is called dispersion. A color band will originate, which is the spectrum with the spectral colors red, orange, yellow, green, blue, and violet.

Doppler Effect

If there is a relative motion between a source of sound (sender) and the receiver, that is to say if their distance is either increased or decreased, then the receiver detects a different frequency than the sender had transmitted (e.g. passing police car with running siren).
If the sender moves towards the receiver, then this corresponds to a shortening of the wave length and thus a corresponding increase of the frequency. If the sender travels away from the receiver, then this corresponds to an increase of the wave length and a corresponding decrease of the frequency. This is also the case with the known red shift of spectral lines of light from galaxies, which, due to the expansion of the universe continually move away from us. At the approach of stars however, a blue shift (shorter wave length) would take place.

Pressure Decrease in Flows

A flow contains two pressure components: The static medium-pressure and the dynamic pressure caused by the flow. The static pressure corresponds to the potential, and the dynamic pressure to the kinetic (motional) energy of the medium. Since the energy of a

stationary flow remains constant, this also is valid for the total pressure, which is made up of the dynamic and static pressure. If a resting medium is caused to flow (by opening a valve), then a dynamic pressure results and thus the static pressure of the medium decreases, in order to keep the total pressure the same (Law of Bernoulli). This pressure decrease shows its effect at right angles to the direction of flow. The principle is used technically in many spray cans and atomizers, as well as in so-called venturi pumps or hose end sprayers.

Pressure Point (Antinode) and Pressure Loop (Oscillation Node) in Standing Waves SW

Standing waves show, at regular distances of a quarter wavelength, places where the displacement is always zero, respectively, at the maximum value of the amplitude. The node (displacement equal to zero) corresponds to the pressure loop (maximum compression or rarefaction). The antinode (displacement equals amplitude), corresponds to the pressure point (zone of maximum density). The standing wave oscillates statically or stationary, no energy is being transported. A particle at the node is always at absolute rest, while a particle at the antinode will alternately pulse fully to the right and then to the left during one period or cycle.

Electron / Positron - Proton / Antiproton

The electron and the proton are elementary particles which constitute the main components of matter. The positively charged protons, together with the neutral neutrons make up the atomic nucleus of material elements, while the negatively charged electrons describe circular orbits around the nucleus. In neutral atoms the number of

electrons equals the number of protons. In artificial nuclear transformations (decay) caused by collision of elementary particles, sometimes radiation will result, which is called beta + radiation consisting of particles, which, except for their charge, are identical with electrons: Positively charged positrons, the antiparticles of the electrons.
The proton also has an antiparticle, which similarly, except for its sign of charge, is identical with the proton. If a particle and an antiparticle collide decay will result. Both particles will change into gamma radiation, an electromagnetic radiation of very high frequency. The reverse of this process is called pair production.

Elementary Particle-Spin - Spin Angular Momentum

Spin is an intrinsic angular momentum of a particle with a fixed value, being characteristic for a specific type of particle. One can assume a particle to be a small top (gyro) in space, turning with a fixed angular velocity. There are particles with half integral spin (fermions) and particles with integral spin (bosons). The spin of an atomic nucleus is composed of the spins of the neutrons and protons (both fermions) which make up the nucleus.

Progressive and Standing Waves

Two waves, which are simultaneously traversing the same medium in opposite directions will superimpose upon a standing wave, provided that both waves agree in amplitude, frequency and wavelength. Most often such standing waves originate if a longitudinal, one-dimensional (linear) wave or a transverse, three-dimensional, spherical wave reaches superposition with itself after it has been reflected. A reflection results when entering into a thinner medium, as

well as when entering a denser medium. If no reflection with above conditions is observed, then one calls it a progressive wave. The amplitude of the standing wave is twice as great as that of a progressive wave.

Structure of the Sun-Atmosphere

The sun-atmosphere is the only thing that we can see of the sun. It has a temperature of about 6000 degrees Celsius and is layered from the inside to the outside consisting of the photosphere, the chromosphere, and the corona. The 400 km thick photosphere or light-envelope constitutes that part of the sun's surface which is visible to us, with the sun spots, prominences and flares. The corona can be visible at total solar eclipses and is the brightly lit surrounding of the sun being about as bright as the full moon. The corona is heated up by impulse waves to an average of 1 million degrees Celsius. The outer edge of the corona forms the transition to interplanetary matter.

Gravitons - Tachyons - Monopoles

Just as electromagnetic fields can be explained with the help of the wave-particle dualism, as a stream of particles of photons, thus one has also tried to do the same for the case of gravitation, for which the corresponding hypothetical particle was called graviton. But to this day it has not been found. The same fate was suffered by the tachyon, which is supposedly traveling with super-light velocity and should allow travels into the past, and also the monopole, the building block of a magnet with only one pole (positive or negative), which has not been seen yet either.

Ideal, strongly degenerated Gas

The concept of an ideal gas is found in connection with the change of volume of gases. If this volume change is indirectly proportional to the pressure, which is imposed on an enclosed gas, then it is called an ideal gas. (Law of Boyle-Mariotte). Helium, a real gas, is considered an ideal gas at a sufficient distance from the condensation point. Watervapor, however, has an approximately 10% higher coefficient of expansion and can therefore not be called an ideal gas.

As a consequence of the equation of state it is also true, that the volume of an ideal gas is proportional to its temperature, as long as the pressure does not change (Law of Gay-Lussac). If a gas is heated it will expand if no extra pressure is exerted on the piston at the same time.

Matter is called degenerated if it is totally ionized, that is, if the positive and negative particles are not coupled together. We know about so-called ”free” electrons in a metal. If those electrons were bound to the atomic nuclei, then the metal would not be able to conduct electricity. By analogy: If in a gas all electrons are free, then the gas is called degenerated and often called a plasma. Since the atomic nuclei and electrons surrounding them are independent of each other, one can not talk about a common temperature any longer, which means, the concept of temperature has no more meaning.

The Process of Induction

A voltage will be induced in a coil, if the magnetic flux penetrating it does change. A similar action occurs when moving a conductor across a magnetic field. This process is called induction. If the

conductor across a magnetic field. This process is called induction. If the conductor loops are closed the induced voltage will generate an induction current. The prerequisite of induction is always a momentary change of the magnetic flux, which can be achieved by changing the magnetic field, or moving the conductor within the field. The induction voltage, respectively the induction current, in a closed loop always acts against the generating flux change (Lenz's Law). With an increase in the magnetic flux the induced current flows against the direction which is derived from the so-called cork screw-rule (right hand rule).

Interference

If several waves traverse a medium, superposition takes place, which is called interference. This calls for the principle of the undisturbed superposition (superposition principle), which means, that at any place and any time, the momentary displacements of the waves involved, may be added to obtain the resulting displacement. These resulting displacements may be positive or negative, which can also result in extinguishing the waves. The maximum total amplitude corresponds to the greatest possible displacement, which can be caused by the interference ata certain time. Even light waves can interfere, provided they are coherent.

Causality

Causality is that relationship, in which cause and effect stand. With respect to events in nature, philosophically, an unbroken and complete causal relationship is assumed. In this the same causes result in the same effects. In physics one tries to relate events to previous events. The circumstance, that an event can only be the

consequence of an earlier event, is called causality. From this can be deduced, that time travel is impossible, especially not into the past. In the theory of relativity, however, it is assumed, that there are events, which have no causal relationship since in time they are so remotely placed, that even light rays can not connect them. In quantum mechanics cause and effect are only connected by means of statistics.

This purely statistical interpretation, by default, results in a total break with all previous ideas in physics. Modern physics rejects determinism (causality) for the microcosmic events, but in so doing it also rejects it for any other events, generally, which are but built up from innumerable micro events. Einstein was convinced, that behind the world of quanta there was hidden the well known world of classical physics (hidden parameters). For this reason he consequently rejected the quantum theory.

Classical Ether (Aether) Idea

Ether is what Aristotle called the heavenly substance, which light penetrates in order to reach earth. Ether, is the Greek word for 'shine'. Since the ether can not be differentiated from the vacuum, it can not move and thus remains at absolute rest. If there is absolute rest, there will also be absolute motion, absolute space and absolute time. The next question was, what is the absolute velocity of the earth compared to this resting ether. Such a value would be of great importance for the philosophy of science.

If light consists of ether waves, as formerly assumed, then velocity measurements of light in the direction of travel and against the direction of travel of the earth, should show differences.

(Michelson-Morley-experiment). Since, however, surprisingly, no differences were measured, the idea of an absolute space was dropped. The theory of relativity was born. This theory can not decide whether there is an ether or not. The great physicist Dirac said in 1953, that the etherless basis of physics theory would soon reach the end of its validity.

Coherence

It is has been found, that several light sources in a room will never extinguish by interference orshow any intensity patterns. The reason for this is, that different types of light sources generally
are incoherent. If light waves from the same wave train are split by reflection, refraction ordiffraction then the waves thus generated are called coherent. Only these types of waves are capable of interference. Laser light allows extreme coherence which is important in holography.

Spherical Oscillator of Zero Order

Most sonic transmitters (oscillators) can be classified in three basic types, depending on the type of direction of propagation, which are spherical transmitters of zero, first and second order. The spherical transmitter (or radiator) of zero order, also called ”acoustic monopole”, can be represented by a pulsating sphere. This is a sphere which periodically changes its radius. The generation of sound therefore depends on a periodic change volume. Thus sound propagates uniformly and symmetrically in all directions.

Light Waves

Electromagnetic waves, with wave lenghts between 390 to 770 nanometers, are waves of light which is visible light. White light, as it comes from the sun or other light sources, is composed of a spectrum of all colors. Contrary to our ear, our eyes can not perceive individual wave lenghts (in sound: notes of a chord; in light colors of white light). Light shows characteristics of wave and particle, and there are phenomena, which can only be explained with waves or only with particles. This had very much confused the physicists of the 19 th century. Today this circumstance has been accepted and absorbed into the theory.

Longitudinaland Transverse Waves

Longitudinal waves can best be described as compressions and rarefactions of a medium, which due to mutual repulsion of the particles propagate with the so-called signal velocity. The waves are caused by a one time or periodic displacement of a particle or that of a spherical oscillator. If it is a periodic displacement, then the particles oscillate about their position of rest by periodically moving in the direction of propagation of the wave or against it. If the original oscillation is harmonic, then we have a sine wave. Sound waves are typically longitudinal waves. The signal velocity of sound is that velocity which depends on the medium.

Transverse waves are waves in which the particles move at right angles to the direction of advance of the wave. In these waves the crests and the valleys of the wave alternate. The point behind the crest of the wave, where no displacement occurs, corresponds to the zone of greatest compression. The corresponding point behind the

valley in the wave is the zone of greatest rarefaction in longitudinal-waves. Waves on the surface of a liquid are typically transverse waves. Electromagnetic waves also belong to the transverse waves. Their signal velocity is equal to the velocity of light.

Lorentz-Contraction explains Michelson-Morley-Experiment

Using a very clever, world renowned experiment, Michelson and Morley in 1886 measured time differences in the travel of light beams, in order to determine the absolute velocity of earth with respect to absolute space. This was done by using a semi-transparent mirror to measure the time differentials of light beams which propagate in different spatial directions. To their disappointment they found nothing. Even minute deviations should have become visible with interference-patterns. Light had ”failed”, but there had to be an explanation for this. Many explanations were given:

a) wrong experiment (Kelvin); b) earth is the center of the universe; c) earth carries ether along with it in immediate vicinity (Stokes); d) the apparatus was shortened in the direction of motion (Lorentz); e) there is no ether (Mach); f) addition theorem not valid for light, velocity of light independent of the observer, meaning, ether can not be proven (Einstein).

It has been shown, that d) can explain the phenomenon. This explanation means, that matter shortens in the direction of motion. If, in so doing one does not want to throw out physical laws of motion, it follows, that clocks which travel run slower. This effect is very small at low velocities, but was clearly proven with highly precise clocks in airplanes. At very high velocities, as for example are achieved in modern elementary particle-accelerators, these effects are quite

obvious and extremely noticeable. Einstein used the idea of Lorentz in his theory of relativity, yet in his space-time-formalism (4-dimensional curved space-time) he does not need the length-contraction.

Mechanical and Electromagnetic Waves (Difference)

While in mechanical waves particles of matter are oscillating, the propagation of electromagnetic waves is not bound to matter. Its signal velocity, contrary to that of mechanical waves, is nearly constant in different media and almost one million times greater. The potential and kinetic energy (energy of motion) of the mechanical wave corresponds to the average electrical, respectively the average magnetic energy density of the electromagnetic waves. The total energy density for both types of waves is proportional to the square of the amplitude.

The outstanding difference between the two types of waves, however, is this: The energy density of electromagnetic waves has a fixed relationship to the oscillation frequency. Mechanical waves, however, can assume any energy value at any frequency.

Mesons

Elementary particles can roughly be separated into three groups according to their weight. Light weight leptons (i.e. neutrinos), heavy baryons (i.e. neutrons) as well as mesons. Those are mostly average weight pions and kaons, which both appear charged and uncharged and have a very short life on the order of a billionth (10^{-9}) of a second. The photon does not belong to any of the three groups mentioned above.

Zero Point Energy

If a gas is cooled off, the temperature movement of its atoms is reduced. At the absolute zero point (minus 273.16º C) this temperature movement should come to a complete halt. Therefore, at sufficient cooling off all substances should crystalize in solid form. But, helium does not become solid, under normal pressure, even at the lowest temperatures. This proves, that even at the point of absolute zero, some motional impulse must exist, namely the zero-point energy. The more space is confined for a particle, the faster it will move (e.g. nucleons in the nucleus of the atom), which points to an increase of the zero-point energy.

Parity Principle

If the spatial mirror image of a possible, physical process in nature is not observable and can not be produced by an experiment, then there is a violation of the principle of parity on hand, or a violation of parity conservation. Most events in physics conserve the parity principle in physics. A parity conservation of a single particle is not required for this. It is sufficient if the parity of the investigated system remains untouched. In spite of this, parity violations have been found, for example with beta decay of cobalt 60: Since the spin-direction remains the same in a spatial mirror reflection, this would require that the electrons, emitted against the spin, should in the mirror image be emitted in the direction of the spin. However, this is not the case, as has been experimentally shown (violation of the left-right-symmetry).

Pauli-Principle

In quantum mechanics one deals with particles which are especially described as a wave, in such a manner, that the square of the wave function corresponds to the probability for the position of the particle. Quantum mechancis does not make any absolute statements any longer, but instead describes the probability of an event or a position. An important statement of quantum mechanics is the identity principle, according to which the exchange of two particles, which show no physical differences, does not lead to any new state.

There are, however, particles called fermions, which follow a peculiar law called Pauli-Principle or Pauli Exclusion: If the mutual effects of two fermions are observed, which are in the same state, (i.e. they have the same wave function), and if one calculates their probability for position, then one finds this value to be zero. This means, the particles do not exist. The conclusion is that the two particles can not both be in the same state. This is a rather abstract consequence of the quantum mechanical formalism.

Photoelectric Effect

Liberating electrons by incidence of light (photon bombardment) is called photo effect or photoelectric effect or light electric effect.
In the boundary layer between two different semiconductors radiation with light will free charge carriers, allowing current to be detected at the electrodes. The velocity of emitted electrons does not depend on the intensity of the light, but only on its frequency. A device which utilizes the photo effect is called a photo element. Solar cells are photo elements with high efficiency. The nuclear-photo- effect is another procedure, namely the liberation of neutrons from the atomic

nucleus by energy-rich gamma radiation.

Photon - Neutrino

Due to the quantizing of energy any radiation can be considered as a stream of particles. The particles are called photons. They are not particles in the classical sense, since they have no rest mass, which means they do not exist when they rest. Photons always move with the velocity of light and thus have momentum. The momentum or impulse creates a pressure when colliding with matter, which is called radiation pressure. If the atomic nucleus is instable, radioactive radiation will result. With a relative proton surplus the following happens with beta+decay: A proton changes into a neutron and ejects a positron (beta+ radiation) and a neutrino. The neutrino has neither rest mass nor charge, just as the photon. The neutrino is stable.

Plasma

The required high temperatures for nuclear fusion (fusing two atomic nuclei), necessitates kinetic energy (energy of motion) which due to thermal motion is essentially higher than the binding energy between the electrons and the nucleus of the light atoms.This causes the electrons to be loosed from the nuclei (ionization) and the entire matter consists of a mixture of free atomic nuclei and free electrons. A gas thus fully ionized is called a plasma. Even nuclei can now collide since they have lost the protecting electron shell.

Quarks

The explanation for the spectra of certain excited particles (including mesons and baryons) can be given by assuming that they also con-

sist of smaller individual particles.These theoretically required particles are called quarks. In experiments thus far 5 quarks have been found which were given the names ”up”, ”down”, ”strange”, ”charmed”, and ”beauty”. It is supposed that there is another quark still, which would receive the name ”truth”. The spin of all quarks is half integral, and the charge, if it is measured in terms of an electron charge, amounts to one-third and two-thirds charges.

In order to explain the behavior of the quarks other characteristics of particles than those known, such as charge, spin and so forth, must be introduced namely ”color”. Quarks can be ”red”, ”blue”, or ”yellow”. Antiquarks can be ”anti-red”, ”anti-blue” or ”anti-yellow”. According to the quark theory only those quark combinations may exist as particles, the color of which is ”white”, and that correpsonds to certain combinations of ”colors” and ”anti-colors”.

Resonators

A resonator is a device which can be excited to resonant oscillations. Some resonators are used to make acoustical measurements. Gas filled hollow spaces, of any shape (especially a sphere) with a neck for an opening are resonators comparable to a spring to which a mass is attached. The oscillation of the spring corresponds to the periodic change of volume of the gases in the sphere.The mass of gas in the neck is being moved back and forth. It can be shown, that such a sphere has a precisely definable resonant frequency which depends on the volume of gas, the dimensions of the neck, as well as the velocity of sound in that particular gas.

If many of those resonators of different size are lined up in a row, it is possible to make acoustical analyses, which are the records of the

frequency portions of an acoustic wave. There are also resonators for electromagnetic waves. A well known example is the optical laser.

Sound Waves

Sound waves are mechanical, longitudinal waves. Originating from a sound source, an oscillating body, they travel in solid bodies, liquids and gases in the form of pressure variations (pressure waves). The human ear usually can hear frequencies from 16 000 - 20 000 Hertz. Higher frequencies are designated as ultrasound, lower ones as infrasound. The amplitude corresponds to the loudness, the frequency of the tone or the pitch, and the shape of oscillation to the overtones or harmonics. The velocity of sound reaches from 170 meters / second (in the noble gas Xenon) to over 1403 m / s (in water at zero degrees Celsius) to 5400 m / s (in quartz glass). In dry air of zero degrees Celsius the velocity is 332 meters / second.

Black Holes

Black holes originate because of the collapse of heavy stars. If a heavy star burns out completely, meaning the nuclear fusion inside the star comes to a halt, then the balance between the radiation pressure directed outward and the gravitational pressure directed inward is disturbed and the star collapses. In some stars this goes so far that not even a beam of light can escape, since the photons with their moving mass are strongly attracted. There is a limit, the so-called Schwarzschild-Radius, inside of which nothing can escape any more.

After surpassing the Schwarzschild-Radius, gravitation increases (according to establishment physics) to infinity and the matter affected gains infinite density, being squashed to zero volume. But, up to

now, there are only suppositions about black holes, as well as hypotheses and speculations, according to the principle: ”Everything goes, which is not strictly forbidden.” But science still owes the undisputable proof to this day.

Oscillation Period

The oscillation period, or the duration of oscillation ‘T’ is that time which passes during the execution of a full oscillation. This time is equal to the reciprocal of the frequency: T=1/f. In mechanical waves the bandwidth reaches from earthquake waves with a period of 100 seconds to hyper sound waves with a period of 10 billionth of a second (10^{-9}). In electromagnetic waves the bandwidth reaches from a tenth of a second to gamma rays with a period of 100 quadrillionth (10^{-15}) of a second and more.

Self-Induction

Changes of the magnetic flux induce a voltage not only in another conductor, but also in the coil itself which produces the magnetic field. This phenomenon is called self-induction. In this case the voltage generated by self-induction opposes the change of current in the coil, which first caused the induction.

Signal Velocity ‘c’

The velocity of propagation of waves is also called signal velocity. It depends on the type of wave, and sometimes also on the wave length, but it always depends on the medium which oscillates, respectively on the medium through which the electromagnetic wave travels. Surface waves can be very slow, while pressure waves range

from 170-5400 meters / second. Electromagnetic waves all have approximately the velocity of light. If dispersion shows up, then it is better called group velocity due to the different signal velocities found with different wave lengths.

Solitons

The life of a wave is limited by the dispersion. A wave packet consists of components with different wave lenghts. They are spreading over an ever larger area with different phase-velocities, they flatten out more and more and finally disappear entirely. A soliton, however, is not a wave packet but an individual wave (consisting of a single half-oscillation) which does not run out but continues compact and in a straight line.

Spin-Magnetism

A particle moving on its path has a spin impulse which leads to a magnetic moment. The particles, however, due to the spin, have an additional magnetic moment which goes in the direction of the spin. Using this magnetic spin one can determine, in principle, the direction of the spin. This is done by deflection of the magnetic moment in a magnetic field. One finds that the spin can only take certain orientations to the magnetic field. From spectroscopic measurements one must conclude that the magnetic moment, due to the spin, is about twice as large as should be expected according to the formula. This magneto-mechanical anomaly can only be explained if one assumes that with a charged particle the direction of the rotational impulse does not agree with the direction of the magnetic moment.

It is interesting, that the neutral neutron obviously also has a magnetic moment and that the proton likewise shows an abnormal value. The phenomenon is explained with virtual particles.

Stationary Flow (Pressure Points)

A flow (flux) means a motion of liquid or gases. The cause of a flow are, for example, gravitation or pressure differences. In order to designate the direction of motion of the flow one uses streamlines. If the paths of the individual particles agree with these streamlines, and if the streamlines keep the same shape for some time, then the flow is called stationary.

If an ideal (frictionless) liquid flows around a sphere, then a stagnation point is formed at the foremost point of contact. At this point the flow velocity becomes zero and simultaneously a maximum pressure builds up at that point (pressure point).
Starting at this point the flow will split, flow around the sphere and form another analogous point on the opposite side 180º away. The flow velocity will increase and reach its maximum value at the equator of the sphere, then decrease until it slows to a standstill at the opposite stagnation point. The pressure decrease inside the flow (at right angles to the flow) around the sphere, will reach its maximum value at the point of the maximum velocity, which is at the equator of the sphere. The forces acting on the sphere at the two stagnation points or pressure points are of equal magnitude, but oppositely directed, thus compensating to zero (see also 12.9 in the Glossary).

No forces will act on a sphere submerged into the (constant) flow of an ideal liquid. On the other hand, a sphere will not be subject to any resistance, if it moves with a constant velocity (uniformly-straight) through a resting, ideal liquid or a resting, ideal gas.

Static Medium-Pressure

Pressure exerted on a liquid or a gas, distributes over the entire medium in all directions with equal force. Or: Inside, as well as at the boundaries of a resting medium, which is not subject to external forces, the same pressure exists everywhere. This is the static pressure of the medium. This all around pressure distribution is explained by the easy displacement of the light-weight particles in liquids and gases.

Different Actions of Reflection (phase displacement) of Longitudinal Waves and Transverse Waves

Longitudinal waves: If a stiff spring is elastically supported and brought to oscillation by pulling it down briefly, then a compression of the spiral windings will transmit downward to the end of the spring. When the compression has reached the end it runs out freely. A subsequent rarefaction (loosening) of the windings runs back up. The reflection at the free or ”soft ” end turns the compression into a rarefaction, which is called a phase shift or phase displacement of 180 degrees.

If the spring is held tight at the lower, the free end, then the compression is reflected and runs back as a compression. In other words, the compression is not followed by a rarefaction, but another compression. A rarefaction will run back as a rarefaction. The reflection at the firm or ”hard” end will reflect a compression as a compression, and a rarefaction as a rarefaction.

Transverse waves: If a horizontally supported rope is fastened flexibly at one end and the other end is made to oscillate by an upward thrust, then a wave crest will move to the other end of the rope. Since the rope is freely movable it can let the wave crest oscillation move upward freely. It is as if this end of the rope is subjected to an upward thrust, which runs back as a wave crest. A wave trough (valley) arriving will run back as a trough. The reflection at the free or ”soft” end sends a wave crest back as a wave crest and a wave trough is reflected as a trough.

If, however, the rope is fixed at the end, then the rope end is not able to carry out an oscillation vertically to the direction of the rope. If therefore a crest arrives, then the previous rope particles can not fully carry out the motion imparted to them, since the fixed end of the rope exerts a pull downward on them, which results in a motional impulse that also goes down. This causes a wave trough to be formed which moves in the opposite direction. For the same reason an arriving wave trough runs back as a wave crest. A reflection at the firm or ”hard” end sends a wave crest back as a wave trough and a wave trough is reflected as a wave crest. This reflection action is called phase shift or phase displacement of 180 degrees.

Vacuum

A space free of any matter is described as a vacuum. This state can be artificially created with the help of a vacuum pump. Strictly speaking, a pure vacuum, however, does not exist. Even between galaxies there are found elementary particles, even if only at minute density. A point in space, however, can very well have an electromagnetic potential. Electromagnetic radiation penetrates the vacuum at the velocity of light.

Virtual Particles

The law of the conservation of energy can, according to the classical particle theory, be violated for a short time, if certain conditions are met. For example, a proton can, for a short time emit a pi+ meson and immediately capture it. One assumes, that the proton decays 1/10 of the time into neutrons and pi+ mesons. Correspondingly, one assumes that the neutron decays 1/10 of the time into a proton and pi-meson. Since pi mesons are not visible they are called virtual particles. The anomaly of the magnetic moment of neutrons and protons is explained by saying that in reality the magnetic moment of the pi-mesons is measured, which only acts 1/10 of the time, but which is, much larger due to the small mass of the pi-mesons.

Wave - Particle - Dualism

Physics has tried to describe these events of nature with mathematical models. Physical elements are assigned to individual components of the mathematical theory. A model is good if it can describe many physical experiments precisely. Usually, for each partial field of physics there exists one model. For light, however, one model is not sufficient. In this case two models are needed which, on top of everything, are contradicting each other.The so-called dualism of particle and wave is due to the fact that certain characteristics of light (or generally of electromagnetic radiation) can only be explained by supposing that light is a wave. An example is polarization. If two polarizing glasses (polaroids) are arranged 90º off center, and then set one behind the other, light will not pass through. The first pair of glasses cuts off all light waves except the horizontal ones which are then blocked by the second pair of glasses which had been rotated 90º. If light is declared to be particles, there is no reason why they should

glasses cuts off all light waves except the horizontal ones which are then blocked by the second pair of glasses which had been rotated 90º. If light is declared to be particles, there is no reason why they should not pass through the glasses. The Compton-Effect and the Photo-Effect (see previous grey box) are, however, a clear proof for the particle character of light.

This contradiction is something the physicists have to live with. This dualism was later also expanded to streams of particles with rest mass, that is, each particle is assigned a wave, the so-called matter wave, which completes the relationship of matter to energy.

13. Energy Generation from SW

In the following the possibilities of energy generation will be defined. Practical designs will be discussed elsewhere.

A SW (standing wave) consists of two equal, progressive waves, which (coherently) oppose each other thus keeping in balance. Progressive waves transport energy (comparable to sound waves). The energy of a SW is not transported further, but it oscillates at the same place.

The central oscillator produces progressive, mechanical waves in the space quanta-medium (SQ-medium), which are reflected at the periphery of the nearly spherical universe, then they run back and thus form unbroken SW in the entire space.

Energy can only be extracted from progressive waves. In order to obtain progressive waves suitable means must be used to disturb the balance in the SW, as is the case with gravitation (detailed explanation under the title: Cosmology). This natural method, in which one component of the SW is weakened by a large mass of matter, is, for obvious reasons not technically feasible.

There is a possible alternative, which is to hinder a component of the SW in its propagation, by rarefying the SQ-medium. If it should be possible to create such a zone of lower SQ-density, then the entire pressure difference of the unattenuated incident wave, coming from outside, can be utilized for energy extraction.

At the periphery of this zone the same conditions will occur as on the surface of a large body, the matter of which has attenuated one component of the SW. This happens in a like manner as a correspondingly weakened SQ-density (example: sun).

In principle, however, as much energy must be expended to weaken the one component, as would be supplied by the second, non-attenuated component. In a ”normal” way nothing can be done about this, unless nature would somehow give us a helping hand. The clarity of the theory presented in this book has made it possible to find the only feasible solution which would allow to manipulate the SQ-medium (compress, rarefy, respectively, limit the potentialities of motion of SQ). This deals with a completely unknown side effect of the magnetic field. This effect only originates after certain modalities of permanent and variable magnetic fields are made to work together in a definite geometrical arrangement (a purely secondary effect).

This effect definitely does not exist in nature, since the necessary conditions for it can never arise spontaneously. The rarefaction or compression of the SQ-medium in the required amount can only be realized because elementary particles continuously adapt to the progressive SQ-density change and because they also change their own pressure values by emission, respectively absorption of SQ, as long as the manipulation process is continued. After reaching a certain level, the rarefaction or compression of the SQ-medium is stabilized in this manner. For this reason the process only requires a minimum fraction of the energy that can be extracted from that process.

Symmetric SQ-manipulations result in concentric force effects (e.g. gravitational pressure). Asymmetrical SQ-manipulations result in asymmetrical forces (one-sided pressure or thrust). This allows, final-

ly, to extract practically unlimited energy from the SW. In this way forces will be available that far surpass nuclear power. The result is an entirely new technology which can not be compared with anything else. At last this would solve the energy problem in an ideal way, clean, eco-friendly without radioactivity or pollution and it can be had at any place in unlimited amounts. Basically, starting with the functional principle, it is impossible to extract unlimited energy from the SW in any other way.

The following practical applications are without exception based on this basic principle. The practical construction is called ”SQM” (space-quanta-manipulator or space-quanta-motor). SQM-systems can be used, depending on the application, for symmetrical or asymmetrical processes, and for this reason two systems will be planned. A combined unit for universal application is also possible.

Applications

We are presenting here some conventional applications of the SQM-principle. Besides this, there is a whole series of really ”exotic” application possibilities which, for obvious reasons, we can not discuss here. This will be done somewhere else later.

14.1. Production of Heat

The production of heat is best accomplished with a symmetrical ”SQM” so that the pressure differences which are also produced, can be compensated. This process creates two separate heat zones, which can be utilized independent from each other. These SQM-units can be used for different heat applications, mostly for large scale users.

14.2. Direct Generation of Electricity

A symmetrical ”SQM” generates DC-current as an SQM-generator in periodic pulses. The principle is rather simple. Periodically the pressure acts on a conductor plate which is firmly connected to the ”SQM”. Since only free electrons can follow this pressure, this generally creates a charge displacement. On one plate there will be an electron surplus (negative polarity) and on the opposite side a corresponding electron deficiency (positive polarity). A DC/AC inverter in the circuit changes the direct current into alternating current which can be used by a load or fed into the public grid (network).

The symmetrical construction fully compensates the mechanical pressures which are created. This allows a quiet and vibration free operation of the SQM-generator. In order to keep the heat production low, which is also generated, low pressures are utilized, which results in a high current with relatively low voltage. For smaller SQM-units air cooling by convection is more than sufficient.

These SQM-generators are usable for large power plants as well as for grid-independent private energy supply of homes, small businesses, industry, cars, trucks, locomotives, ships of any size etc.

14.3.Power Source (Thrust) for Airplanes

An asymmetrical ”SQM” can provide the necessary thrust for powering airplanes of any type. Depending on the size of the SQM-unit practically any amount of energy will be available. This will make it the rule for vertical take-off and landing even at the highest weights involved. This means any place is suitable for starting and landing. Airports with starting-and landing runways will not be required. The flight velocity will not be limited by air resistance or air friction because if large amounts of energy are expended, the entire air in the vicinity will become ionized and thus be repelled. The thrust is not only used for forward motion (acceleration), but it will also support the entire weight of the plane. Therefore, wings will no longer be necessary, which will allow much simpler airplane designs.

Due to the type of drive (asymmetrical, gravitational pressure), physically speaking, the flying object will essentially be in a free fall. This will compensate any inertial forces resulting from acceleration and ”deceleration”, which will allow extreme flight maneuvers, only limited by the energy available. There are no destinations which can not be

reached in a direct flight since the propulsion energy is useable for unlimited time. The environment will no longer be polluted by exhaust gases or noise.

14.4. ”SQM”-Large Scale Plants for Regeneration of the Polluted Environment

Eco-friendly disposal of household refuse, industrial waste, sewage sludge, poisons etc. is made possible with ”SQM”-high temperature-incinerators. Even the most energy consuming recycling systems for reclaiming raw materials can be used, which is equivalent to total recycling. If energy is available in unlimited amounts, then it is thinkable to use large scale plants to clean up polluted waters such as rivers, lakes and possibly oceans, as well as polluted air and soil.

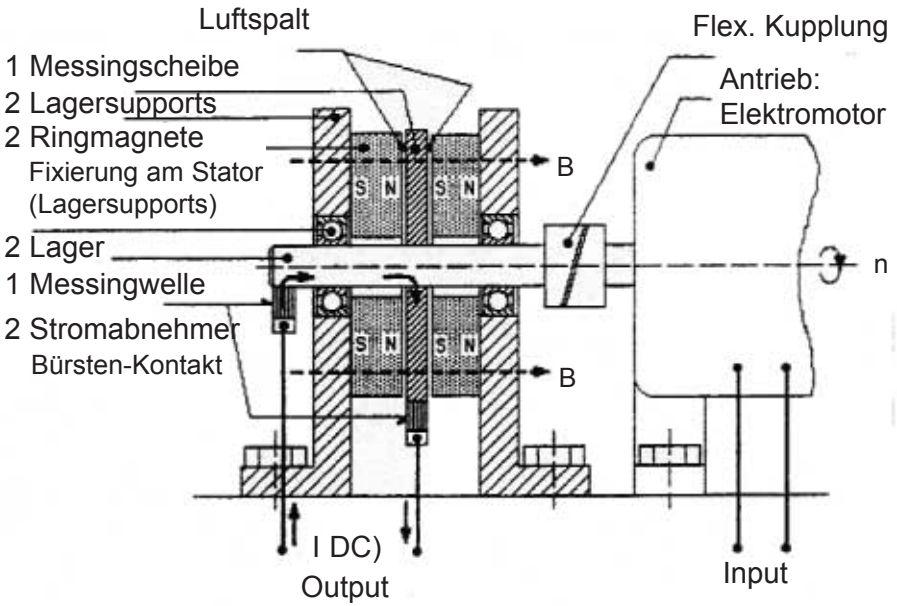


Abb. 1: Homopolargenerator, Magnete stillstehend

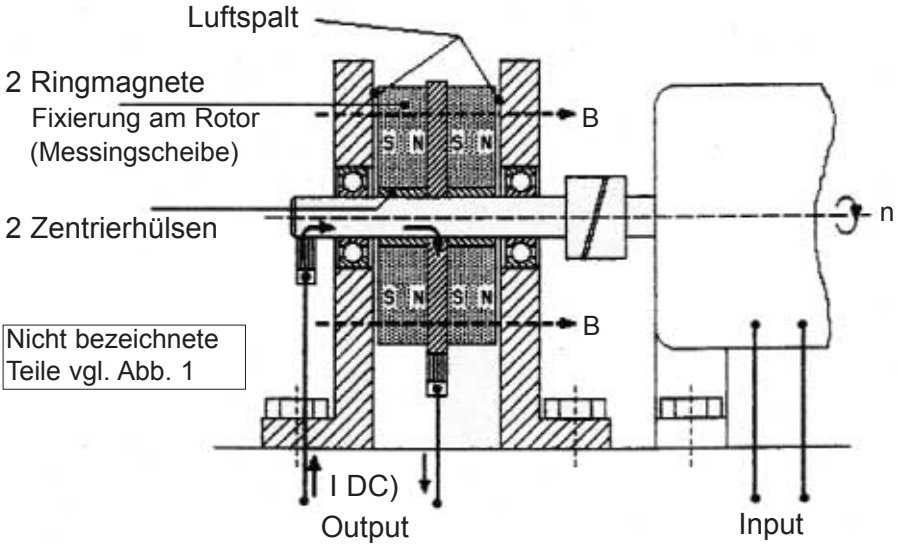


Abb. 2: N-Maschine, Magnete rotierend

15. Definition of the N-Effect

There are four cases of different combinations to be considered:

1. disk conductor resting -permanent magnet resting
2. disk conductor resting -permanent magnet rotating
3. disk conductor rotating -permanent magnet resting
4. disk conductor rotating -permanent magnet rotating together with disk

15.1. Disk conductor resting - permanent magnet resting

A resting, free conductor-electron inside of a constant SQF, is always surrounded by a stationary flow. In this case it is the circularly rotating SQF of the permanent magnet. A constant magnetic field does not therefore exert any effects on a resting electron. An induction current only shows up when entering into or removing the non-ferromagnetic disk from the circularly rotating SQF.

15.2. Disk conductor resting - permanent magnet rotating

The flow intensity (and thus the magnetic field strength of the permanent magnet) of the SQF changes when rotating the permanent magnet according to the Monstein-Effect (explanations under title 16. Monstein-Effect), as opposed to the resting state (depending on the direction of rotation, the rotational velocity and the magnetic field strength). During the acceleration, respectively the deceleration phase (which must be carried out rather quickly), a voltage can be measured between the periphery of the disk and the axis using a non-moving contact.

At a constant rotational velocity, however, a stationary flow is formed again around the free conductor-electrons and therefore no voltage can be measured. The situation is thus the same as with a non-rotating magnet.

According to Maxwell's third equation, a moving magnetic field generates an electric "eddy field" at right angles to the direction of motion, thus an induction current should be flowing in the conductor disk. Regrettably such is not the case!

15.3. Disk conductor rotating - permanent magnet resting

If a conductor is moved inside an SQF then the free electrons inside the conductor will shift (due to the one-sided flow pressure) compared to the non-movable protons and thus they generate their own SQF.

The free electrons moving with the disk produce an SQF which is flowing counter to the direction of rotation of the non-ferromagnetic disk. If the flow directions of the disk conductor -SQF and the circularly rotating SQF of the permanent magnet are opposing, then the SQF of the magnet exerts a repelling pressure on the opposing SQF of the free conductor electrons on both sides (at right angles to the direction of motion). This, however, practically compensates the repelling forces on the electrons.

A pressure drop for the electrons now exists between the static pressure of the medium acting radially from the outside and the increasing low pressure in the direction of the center of the circularly rotating SQF of the magnet. This causes the free electrons all around, in all sectors of the disk, to be simultaneously pushed towards the

center by the static pressure of the medium, as far as the electrostatic repelling pressure allows. Between the periphery (positive pole) and the axis (negative pole) of the disk a voltage can now be measured using a non-rotating contact. (Fig.20).

If the flow directions of the disk conductor-SQF and the circularly rotating SQF of the permanent magnet, however, are all in the same direction, then the free electrons are repelled unilaterally in the direction of the periphery of the disk. This is accomplished by the opposing flow of the circularly rotating SQF in the sector lying 180º across. The SQF of the magnet in the 180º opposite sector, moves counter for every free electron of the disk.

The static pressure of the medium now pushes together the two unidirectional flows, namely the SQF of the free electrons and the circularly rotating SQF of the permanent magnet.The free electrons are thus pushed against the periphery of the disk, as far as the electrostatic repelling pressure allows. Between the periphery of the disk (negative pole) and the axis (positive pole) a voltage can now be measured using a non-rotating contact. (Fig.21)

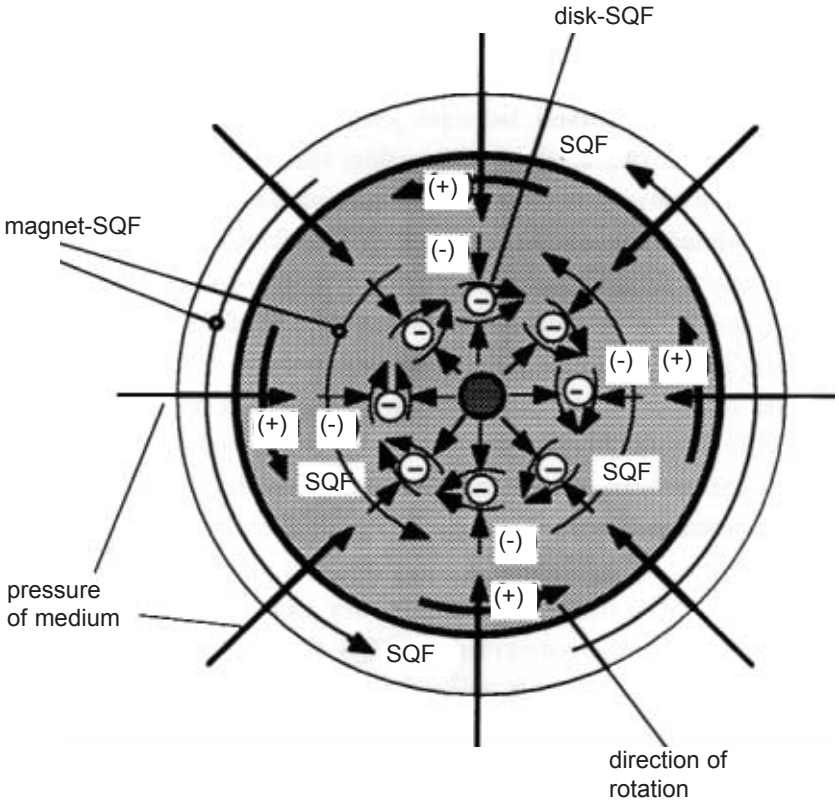


Fig. 20. Disk conductor-SQF opposing permanent magnet-SQF.

According to Maxwell's third equation now no induction current must flow in the disk conductor, since the magnetic field is not moving and thus no electric "eddy field" can be produced. An electric field is (also according to Maxwell!) an absolute prerequisite for a current to flow in the disk conductor. Regrettably (again!) the very opposite is happening.

Heisenberg once remarked correctly that the basics of physics are dangling over an abyss... One of these basics, namely the third equation of Maxwell says, that a changing or moving magnetic induction field generates an electric field. Very obviously this basic-law is completely wrong, for there is no agreement with the experimentally obtained facts, and everything else built on this fals hypothesis must consequently be just as wrong, which can also be proven.

Incidentally: Whoever wants to use "relative motions" as an excuse, in this case, can also be refuted: If the disk is moving, opposed to the resting magnet and a voltage can be measured at that time, then naturally this must also be true in the opposite case. But, sorry, this is not the case, for, with resting disk and rotating magnet no voltage can be measured. Beyond this there is a case with no relative movement, namely when the magnet and the disk rotate together, and of all things in this case a voltage can be measured! This eliminates relative motion as an unusable "explanation".

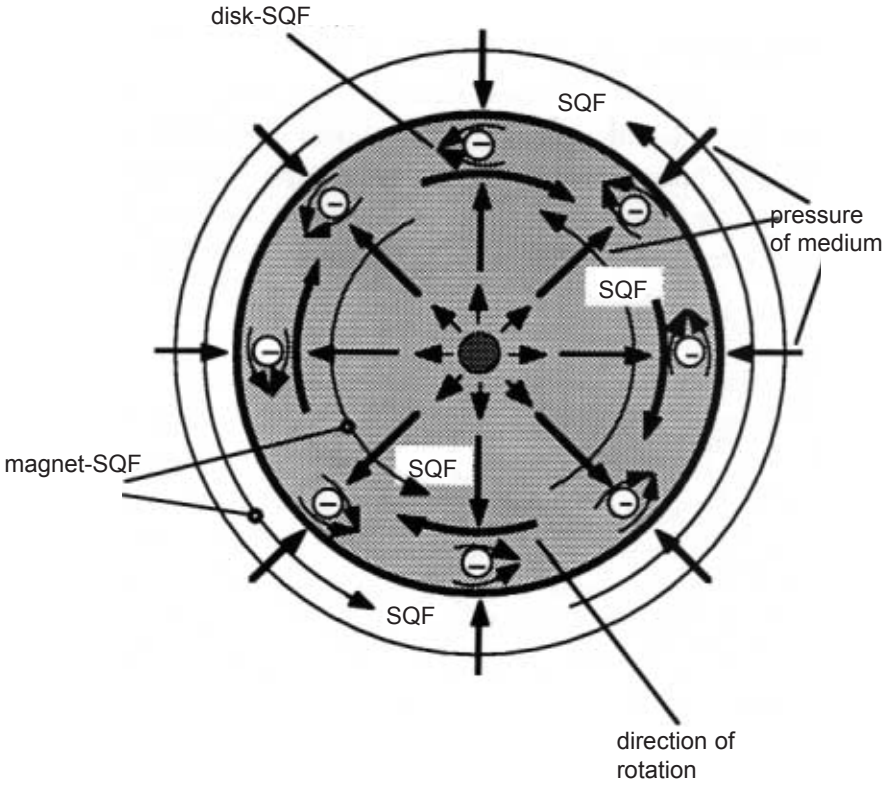


Fig. 21. Disk conductor-SQF unidirectional with permanent magnet-SQF.

15.4. Disk conductor rotating - permanent magnet rotating together

As can easily be seen, nothing changes in principle compared with the previous Case 3. The rotation of the permanent magnet now shows the Monstein-Effect. (explanation under 16. Monstein-Effect).

15.5. Conclusion

The Monstein-Effect exerts a certain delay of the mechanical reaction to the current draw of the N-machine. The energy apparently gained had to be expended additionally when accelerating the rotor earlier. All experimenters so far have been deceived by the Monstein-Effect.

16. Monstein-Effect

Explanation by O. Crane for the article "Asymmetrical Moments of Mass Inertia of rotating cylindrical magnets?"
by Christian Monstein, Electrical Engineer, published in SAFE-NEWS No. 3/4 1991

The asymmetry discovered of rotating cylindrical magnets is not a change of mass inertia. Neither can the Einstein- de Haas- Effect be used as an explanation. The Einstein- de Haas -Effect of 1915 only measured the angular momentum (spin) of the electrons, which cause the magnetic field of a cylindrical magnet. This kinetic energy, even for a larger magnet, only amounts to a few micrograms and can therefore not be used for the explanation of an effect being several orders of magnitude greater. This sets up the Monstein-Effect as a new physical fact.

The parity violation discussed is caused by relative motion compared to the space quanta flux SQF at the state of rest (magnet not rotating).

Parity Principle
If the spatial mirror image of a possible, physical process in nature is not observable and can not be produced by an experiment, then there is a violation of the principle of parity on hand, or a violation of parity conservation. Most events in physics conserve the parity principle in physics. A parity conservation of a single particle is not required for this. It is sufficient if the parity of the investigated system remains untouched. In spite of this, parity violations have been found, for example, with beta decay of cobalt 60: Since the spin-direction remains the same in a spatial mirror reflection, this would require that the electrons, emitted against the spin, should in the mirror image be emitted in the direction of the spin. However, this is not the case, as has been experimentally shown (violation of the left-right-symmetry).

The magnetic field of a permanent magnet consists of a circularly rotating SQF around the magnet's axis and is caused by the mutual action of spin electrons involved with the SQ. A specific SQ-flux-intensity corresponds to a certain mutual action (magnetic field strength).

16.1. Rotation against the SQF

Looking at the north pole the magnet is rotating clockwise. The acceleration counter to the SQF causes an increased mutual action of the involved spin-electrons with the SQ, in the direction of rotation, thus requiring additional energy (compared to a similar, unmagnetized object). As a consequence the SQF increases which can be directly measured as an increase of the magnetic field strength.

When coasting down freely, the additional SQF decreases again in the form of an additional angular momentum in the direction of rotation, causing a longer coasting time than an identical, unmagnetized object. This asymmetry becomes the larger, the higher the magnetic field strength and rotational velocity of the permanent magnet.

16.2. Rotation unidirectional with the SQF

Looking at the north pole the magnet rotates counterclockwise. The acceleration in the direction of the SQ-flux results in a smaller mutual action in the direction of rotation by the involved spin-electrons with the SQ and thus requires a smaller amount of energy (compared with a simlar, unmagnetized object), since the decrease of SQF provides additonal angular momentum in the direction of rotation. This attenuation of the SQF is directly measurable as a decrease of the magnetic field strength.

When coasting down freely, the original SQF builds up again. This causes a greater mutual action of the involved spin-electrons with the SQ in the direction of rotation thus requiring additional energy. This energy is taken from the (kinetic) rotational energy and this results in a shortened coasting time compared to a similar, unmagnetized object. This asymmetry is the greater, the higher the magnetic field strength and velocity of rotation.

16.3. Additional commentary

The left-right symmetry is here violated twofold:

1. Asymmetrical rotational behavior depending on the direction of rotation.

2. Magnetic asymmetry depending on the direction of rotation.

This is the first time that a double violation of parity has been discovered.

Accelerated rotation in the direction of the electron-spin-rotation increases the mutual action with the SQ. Accelerated rotation against the direction of the electron-spin-rotation decreases the mutual action with the SQ. Caused by the parallel-spin-position of the involved electrons, opposite spin-SQ-flows will always result which repell each other, respectively compress (Bernoulli-Principle). If the SQF is increased the mutual repelling pressure of the spin-SQ-flows increases and vice versa.
The end result is a stationary SQF inside the permanent magnet, which has stored quite an amount of energy in the form of deformation. When decreasing these SQF the stored deformation energy is

again released as kinetic energy. This process has a certain similarity with the familiar self induction. The internal increase of additional SQF thus requires more energy than is found in the relatively small magnetic field strength-increase outside of the permanent magnet.

16.4 Determination of the SQ-Flux Direction

Looking at the north pole the SQF rotates counterclockwise. Looking at the south pole the SQF rotates clockwise.

Concerning spin magnetism, the SQF of negative elementary particles moves counter to the direction of the spin-rotation and with positive elementary particles it moves with the direction of the spin-rotation. (see Fig. 11a. and 11.b.).

16.5. Additional Practical Experiments

It has been planned to make the Monstein-Effect even more clear by additional and complementing, demonstrable experiments:

1. Experiment with an alnico-bar magnet of 13-fold field strength (compared to the magnets used thus far of 101 mT) and using about 500 Hz angular frequency. (30 000 r.p.m.).

2. Reference measurements using a similar, demagnetized alnico bar magnet. Reference measurements using a similar, demagnetized ferrite bar magnet.

3. Parallel rotation of two similar ferrite bar magnets, which can be adjusted parallel to each other. The mutual influence of both SQF (either unidirectional or opposing SQ-flows) employing unidirectional or opposing directions of rotation, as well as different speeds shall be investigated and the effects determined upon the rotational-asymmetry. Parallel rotation of metal magnets (advantage: much greater magnetic field strength) is unfortunately not possible due to the mutual induction of strong eddy currents (eddy current brake).

16.6. Gyromagnetic Effects compared with the Monstein-Effect

Barnett-Effect: Only the very weak magnetization at 3600 r.p.m. was measured. Any differences between left- or right hand rotation were eliminated considering only the statistical average value. The mechanical asymmetry was not considered at all. This shows that the Barnett-Effect has nothing to do with the Monstein-Effect.

Einstein-de Haas-Effect: Although a magnetized iron rod, up to full saturation, was totally demagnetized (using a high current capacitor discharge), the result only showed a reaction in the range of a few micrograms. The Monstein-Effect changed the magnetic field strength by only a few milli-Tesla. However, the mechanical asymmetry which appeared, was 7 to 8 orders of magnitude greater than in the Einstein- de Haas Effect!

Hinweis: Der 2. Teil erscheint nicht auftgrund des Todes von O. Crane 1992.

Part 2

by J. M. Lehner

1. The First Meeting between Crane and Monstein and the following Cooperation

Since O. Crane as well as Chr. Monstein were active members of SAFE (Swiss Association {for work on} Free Energy), they briefly met for the first time at the First International Congress for Free Energy at Einsiedeln (Switzerland) in October of 1989. This congress was visited by about 900 members from 17 countries (including North America and Asia). Crane was a participant in the congress and authored the article ”What is it that keeps the world together at the core?” published in SAFE-News No.1/2, 1989. That was the first publication by Crane about the subject ”Central Oscillator, Space-Quanta-Medium and Space-Quanta-Flux”. This essay also contained a number of sketches about the Magyary-Effect, about space quanta-flux of the moving electron and proton, as well as drawings of the magnetic space-quanta-flux of a permanent magnet.

Chr. Monstein was also present demonstrating the C-generator device - see Fig.1-3 below. He explained to all present noteworthy items about the device and described measurement results using clear diagrams.

However, at that time no personal contact between Crane and Monstein had taken place. This personal conversation did not occur until March 1990 at the occasion of a lecture by O. Crane at the ‘Hotel Glockenhof ’ in Zurich, which Chr. Monstein attended. The lecture evening had been organized by Werner Rusterholz, editor of SAFE-News and board member of SAFE.

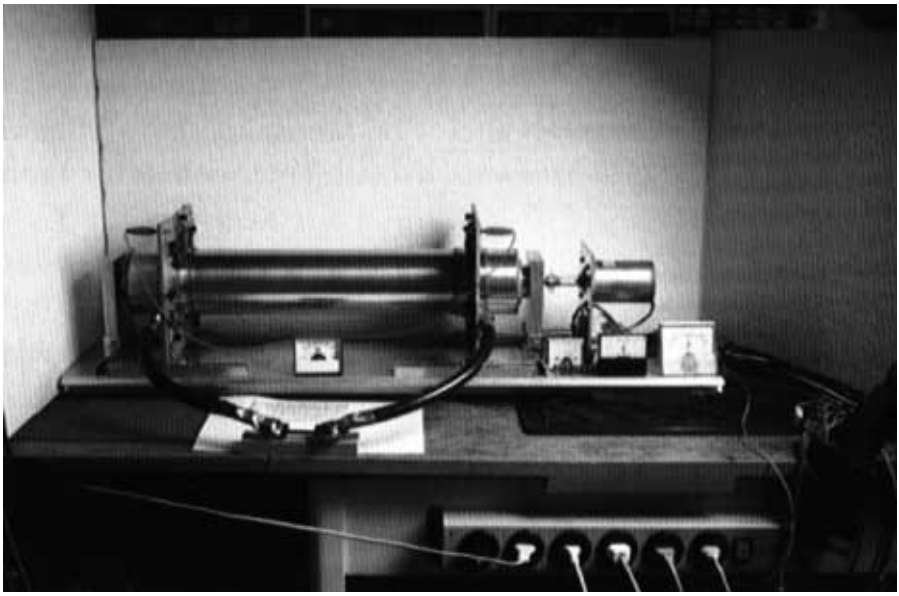


Fig. 1 Photo of C-Generator, driven by a DC motor as it was demonstrated at the international SAFE-Congress in Einsiedeln (Switzerland) by Chr. Monstein during October 1989.

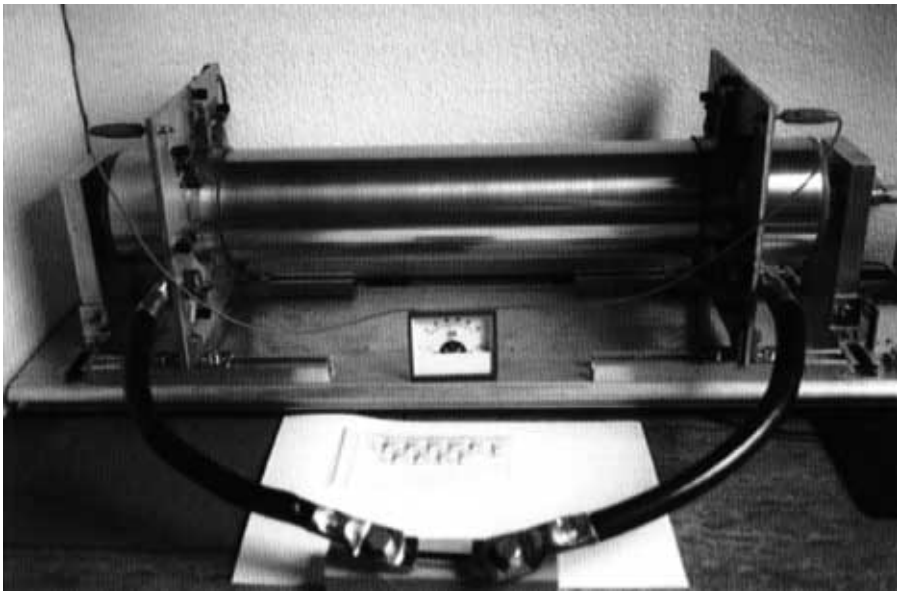


Fig. 2 Detail photo of the C-Generator by Chr. Monstein. Revolutions of 3800 - 4200 r.p.m. depending on the direction of rotation and the use of the same input power for the motor.

rotor element, C-generator

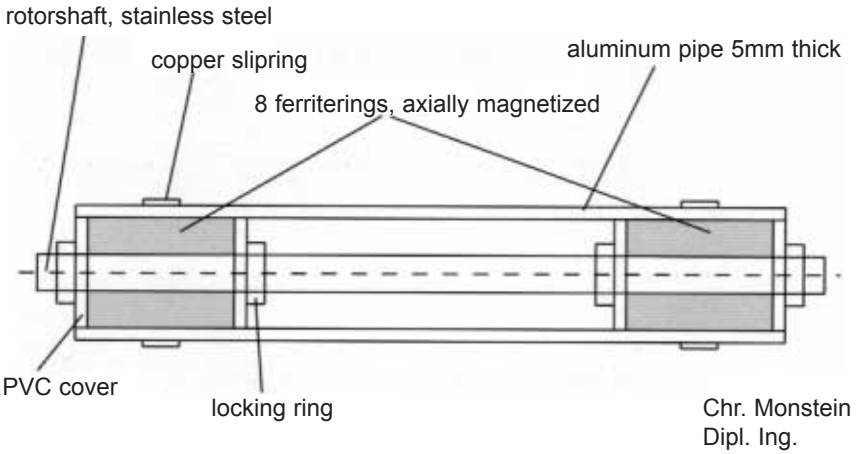


Fig. 3 Detail drawing of the rotating part of the C-generator

In the summer of 1990 Crane and myself (as manager of the publishing house and as promoter) went together to visit our new friend Chr. Monstein. After a hearty welcome-drink he took us into his laboratory and explained and demonstrated to us all important private metrology projects.

This encompassed everything from fully computerized, automatic solar frequency measurements to the already mentioned C-generator, which caused him a lot of headache. There was an even greater problem: In the aluminum pipe of the C-generator he had some ferrite-magnet-rings with large diameter (80 mm) and this cylinder could easily be accelerated with a DC motor at hand in one direction up to 4200 r.p.m. In the other direction, however, the time of acceleration took a lot longer and the maximum revolution only climbed up to 3800 r.p.m. with the same power input to the DC motor.

The entire procedure was fully computerized and all data were stored. Christian Monstein, being a metrologist with a lot of experience, as well as several other members of SAFE, from electrical engineers to a physics professor, all were unable to explain this phenomenon of the C-generator!

When O. Crane was approached about this problem he briefly said: ”That is very simple, this is due to the magnetic space-quanta-flux”. ”What do you mean?”, asked Chr. Monstein. O. Crane responded: ”In the first case the direction of rotation is unidirectional with the space quanta-flux of the ferrite magnets and in the second case the direction of rotation of the cylinder is counter to the flux direction.
This is why it takes more energy for the acceleration and that is why, with the same input power you only reach 3800 r.p.m. It’s that simple!”

After this Chr. Monstein had a small test model designed, which was pictured in SAFE-News 3/4 1990 (Fall Edition) (see the first photo, and sketch in the next chapter by Chr. Monstein).

In over 300 computerized test measurements using all possible directions and positions Chr. Monstein with his work proved the magnetic space-quanta-flux SQF_m according to O. Crane. He was using a small alnico bar magnet of 12 mm diameter and 30 mm length and a field strength of 101 mT.

This publication by Chr. Monstein created much joy for O. Crane, since this was the first time that the space-quanta-flux predicted in 1989, had been proven. O. Crane thanked Chr. Monstein very much for his detailed work and pointed out, that this effect was new in the history of physics and should be given the name ”Monstein-Effect”. At

the same time he also pointed out that there was an important factor which had not been mentioned and asked him to check his measurement data whether in the different directions of rotation, especially during acceleration and deceleration he had noticed different field strengths. And low and behold! In fact, Chr. Monstein was able to subsequently provide important data as follows:

1. that during acceleration in the direction of the flux of the SQF_m a decrease of the magnetic field strength could be shown and

2. that in the opposite direction of rotation an increase of the magnetic field strength had been measured and recorded.

”That is phantastic! That is the second parity violation in the macroscopic field”, said O. Crane about these results.

This means, Chr. Monstein discovered a double parity violation in the macroscopic range during his experiments!

This work was published and documented in SAFE-News No. 1/2 1991.

In addition to the first publication about rotating cylinder magnets, Monstein also published calculations which show, that the effect without using the PVC pipe actually shows a 13% difference. This is due to the fact that the PVC pipe used for the measurement together with a white teflon ring almost constitutes half of the total weight of the rotating mass. And, since the PVC pipe is a non-magnetic material it weakened the actually appearing differences between left and right hand rotation of the pure magnet. The 300 computerized measurements showed a difference of between 4-6 %.

Based on this metrology work by Chr. Monstein, O. Crane wrote the theoretical basics for the Monstein-Effect.

You can easily imagine that based on the success achieved together already, that the cooperation between O. Crane and Chr. Monstein became more interesting and more fruitful. Therefore more experiments and metrology processes were discussed. Chronologically followed the Ditchev-experiment, the Hooper / Monstein-Experiment and the most interesting of all: the Barnett / Monstein-Experiment. All these measurements were carried out and documented between January 1992 and April 1992.

This also explains why the printing and shipping of this book (this applied to the first German edition) took a few months longer. Another circumstance occurred in Chr. Monstein pointing out some interesting publication in ”Stars and Space” to O. Crane.(Monstein is an active solar researcher). This caused O. Crane to treat the chapter on Cosmology somewhat more thoroughly and to expand the new solar theory and present it graphically. The published articles in ”Stars and Space” 1/1992 were discussing the anticorrelation between sun spots-cycle and neutrino-measurement results.

In July 1992 we received new neodymium-iron-boron alloy magnets from the U.S.A., with a diamter of 5 cm and a length of 7 cm. Those are the strongest magnets that we ever had available for any measurements. The results of course are correspondingly impressive and do not leave any more room for the obsolete, 200 year old magnetic field theory. The measurement results clearly show that the newly discovered magnetic space-quanta-flux SQF_m can not be explained away because the measurement is a proof. A the same time we have comparable data available having used an identical, non-magnetized

cylinder out of the same material. The difference is almost unbelievable.

I rejoice with O. Crane and Chr. Monstein that we were able to conclude the work at the end of August 1992 and were able to turn the material over to the printer so that the book could be printed and be ready for the 44 th Frankfurt Book Fair on September 30, 1992.

At this point I would like to thank those mentioned by name for all the work they have accomplished.

Dear reader, you have the result in your hands.

The technological application of these new insights will be carried out by the Rapperswil Company SQM (RQM in German) Space-Quanta-Motor Inc. (AG), which is now being founded. The goal of the new company is to patent, produce and sell space-quanta-motors for energy generation and for space travel. The entirely new technology will also be offered through license agreements.

Rapperswil, 31. August 1992

Jean-Marie Lehner,
Publisher and Promoter of
the SQF_m and SQM-Technology

Part 3

by Chr. Monstein

Monstein-Experiment 1991 (Monstein-Effect)

The experiment carried out by Chr. Monstein at the beginning of 1991, using rotating bar magnets (101 mT) inside a PVC-pipe. Measurement of the difference of free coasting at 18 000 r.p.m. in a clockwise direction and in a counterclockwise direction, looking at the north pole.
Proof of the space-quanta-flux SQF_m according to O. Crane.

1. The first Meeting between Crane and Monstein and the following Cooperation

The beginning of this work was the publication by O. Crane "What is it that keeps the world together at the core?" in SAFE No.1/1989 and an additional lecture held on March 16, 1990 at the 'Glockenhof ' in Zurich. In following discussions with colleagues the question came up, whether it would be possible to show a differential angular momentum, or moment of inertia, in fast turning, axially magnetized bar magnets and all depending whether the bar magnet was turning clockwise or counterclockwise when looking at the north pole. If the SQF (space quanta flux according to O. Crane) indeed existed, one could imagine that it is decisive, whether magnetized objects were moved in the same direction as the SQF or in an opposite direction. The possibility of course also exists that the effect might possibly be explained with formalisms and explanations coming from the experiment by Einstein and de Haas.[1] Explanations, however, should be using conservative physical concepts. In many books one finds formalisms concerning the relationship between angular momentum and magnetic field [2], but mostly just for simple atoms and not for complex ferromagnetic materials. Unfortunately the author does not have the necessary mathematical-physical background to solve these problems himself.

For this reason I had decided to solve the problem by means of metrology. My school colleague and radio friend Hans-Peter Benz was gracious to offer to build a device, at his cost, to use for the determination of differences depending on the direction of rotation. The device consists of a machined PVC-pipe, into which an ALNICO-bar magnet was pressed. (Fig. 1 Detail Sketch).

On both sides of the pipe a brass shaft was pressed and on each shaft a special ball bearing was mounted. Both ball bearings are each individually mounted on a PVC-support which allows to exchange them quickly or to switch them. This “magnetic” PVC-cylinder has been balanced and runs free of play with very little friction. The PVC-cylinder can be set into motion with a device consisting of a DC motor with flanged rubber wheel. This allows revolutions up to 40 000 r.p.m.! As soon as the PVC-pipe has reached the desired speed the drive unit is removed and the pipe will return its mechanically stored energy by slowly reducing its speed until it stops.

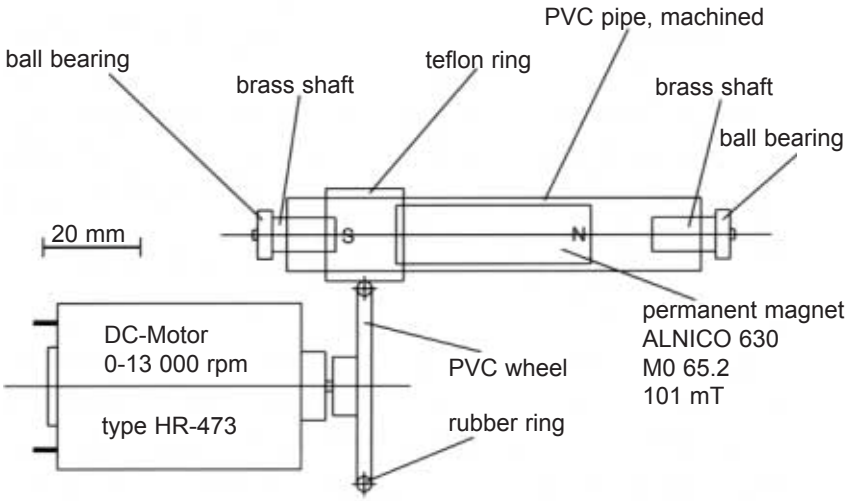


Fig. 1 Detail Sketch

The energy is converted into heat by friction in the bearings and sound in the air. The speed is continuously being measured during the coasting and recorded with respect to time by using a tachometer adapter and a precision multimeter both connected via a 488 IEEE Bus to a personal computer.

Measurement Procedure:

First it is determined what the direction of rotation will be with respect to the north pole, i. e. according to O. Crane positive is counterclockwise looking at the pole, negative means clockwise in agreement with the definition of current direction in an electric field. Then the computer program is started which controls the data recording, next comes starting the cylinder by hand, using the drive described above until the speed of 25 000 r.p.m. has been surpassed. Then shutting down the motor and putting it away and waiting until the rotational energy has been used up and the cylinder has stopped. Depending on various conditions, this can take several seconds to one minute. During this period the computer without fail registers quartz time and speed. At the same time the computer shows a graphic image of the speed curve on the monitor (Fig.2) and stores the data on the hard disk using sequential file numbers.

The example presented in Fig. 2 shows two curve segments. The first segment up to the time of t = 10 seconds describes the acceleration process with the DC motor. This curve segment is not used for any later evaluation, it is only shown here for completeness.

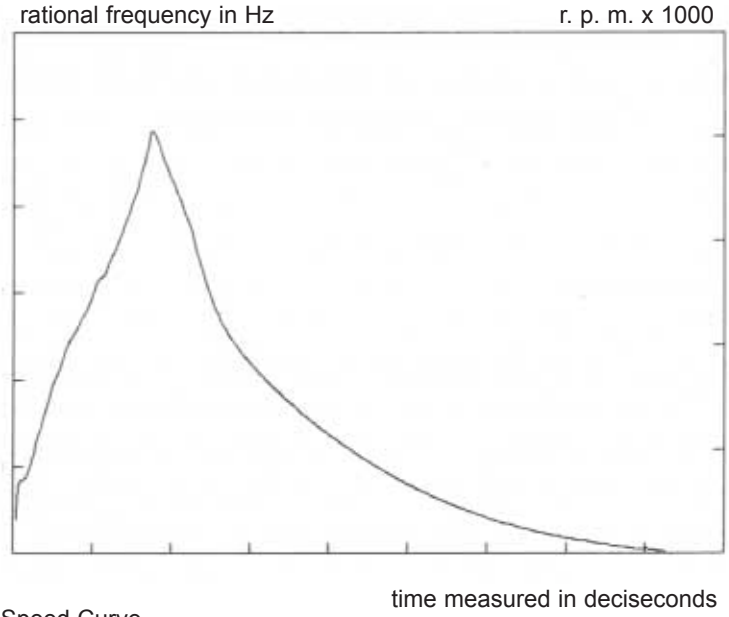


Fig. 2 Speed Curve

The second, descending part of the curve describes the interesting coasting process F(t). This measurement procedure is repeated 278 times, each time under different boundary conditions in order to mostly eliminate, if possible, any systematic errors. This means the following, periodic variations are carried out each time:

1. 3 measurements in positive direction according to SQF,
2. 3 measurements in negative direction according to SQF,
3. turn the bearing on the drive side 180º and repeat measurements 1. and 2.
4. turn the bearing on the sensor side 180º and repeat measurements 1. and 2.
5. exchange both bearings, without turning and begin at item 1.

In the meantime the bearings have to be periodically dismounted, cleaned, freshly oiled and put together again, after which above sequence is repeated. In all, as mentioned, 278 measurement series were conducted, of which 220 are reasonable. Reasonable here means, that there were no recognizable optical or acoustical disturbances, as for example strong resonances caused by inaccurate mounting, computer crashes caused by memory/ disk storage overloads, problems with the tach-adapter etc. every one of these 220 measurement series consisted of 92 to 236 data pairs. The difference in the number of data pairs is due to outside conditions such as degree of pollution level of equipment, temperature, and quality of the lubricating oil. A single data pair is comprised of the respective quartz time ‘ t ’ since dropping below 20 000 r.p.m., in tenths of seconds and the measured rotation frequency f (t) in Hz. All in all about 36 000 data elements were used for the evaluation (576 000 bytes)! Without a personal computer it would have been a practically impossible job of endurance and diligence. The actual measurement work, thanks to the computer help, takes only about 10 hours, while the time for evaluation and analysis takes another approximately 80 hours.

First Phase of Evaluation:

The curves for speed and time are to be properly defined. Based on the different values measured I decided to document and compare the angle traversed for each measurement event. The angle Φ covered is the integral of the angular frequency Ω (t) over the time ‘ t ’ passed:

$$\Phi := \int_{t2}^{t1} \Omega(t)\, dt \qquad \text{bzw.} \qquad \Phi := \int_{t2}^{t1} 2 \cdot \pi \cdot f(t)\, dt$$

due to the lack of measured values I chose the transition to a sum of finite, discrete measured values as supplied by the computer, as follows:

$$\Phi := 2 \cdot \pi \cdot \sum_{t} f(t) \cdot \delta t$$

In this case, however, the speed frequency for evaluation (not for data gathering) must be limited on the basis of the specification for the tach-adapter to the range from 1000 r.p.m. <n < 20 000 r.p.m. Data thus calculated and shown graphically (Fig. 3) range between 8000 kilorad and 20 000 kilorad, where 1 kilorad = 1000 x 360º.

Angular Velocity

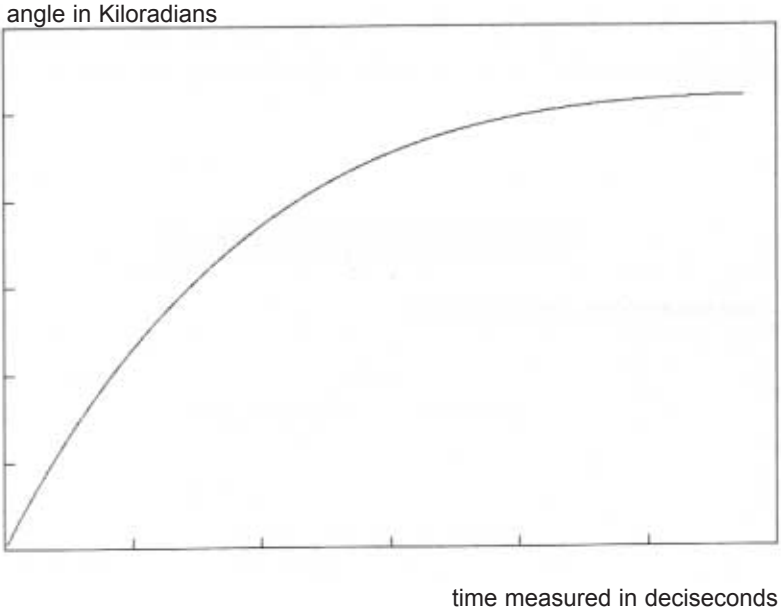


Fig. 3 Angular Velocity

Next the quotient is set up from the angle traversed in the positive direction Φ <+> (against the SQF_m) and the angle traversed in the negative direction Φ <-> (parallel to the SQF_m), thus:

$$q' \text{ (experiment)} := \frac{\sum_{Tpos} fpos\,(t) \cdot \delta t}{\sum_{Tneg} fneg\,(t) \cdot \delta t}$$

The 220 measured values thus derived (110 with positive direction of rotation and 110 with negative direction of rotation) result in 110 quotients. These have been represented in the order of their appearance (Fig.4). The symmetry axis for a non-magnetic case has also been shown.

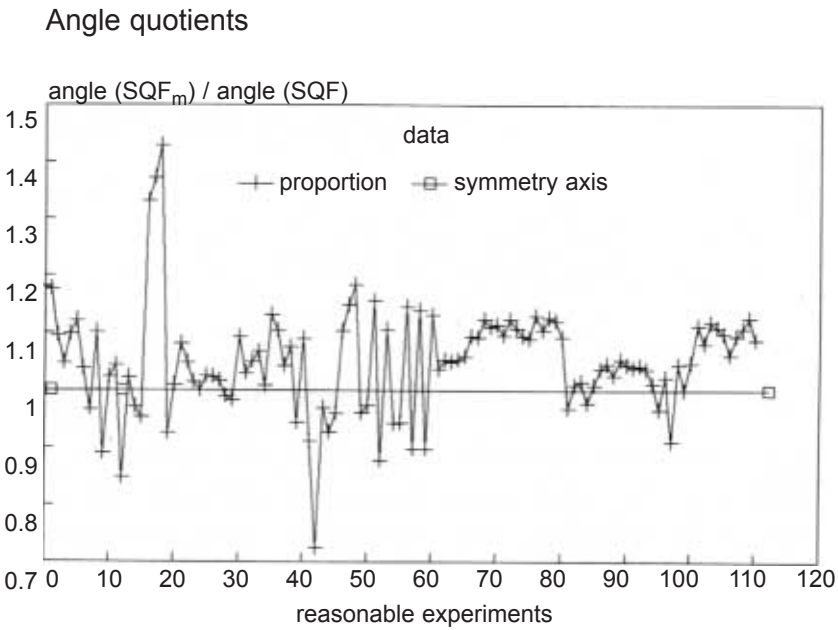


Fig. 4 Angle Quotients

Second Phase of Evaluation:

The 110 quotients mentioned above are now treated statistically, i.e. they are sorted into so-called quotient-classes with a class width of 0.01. The corresponding Quotient-Deviation Diagram is shown in Fig. 5.

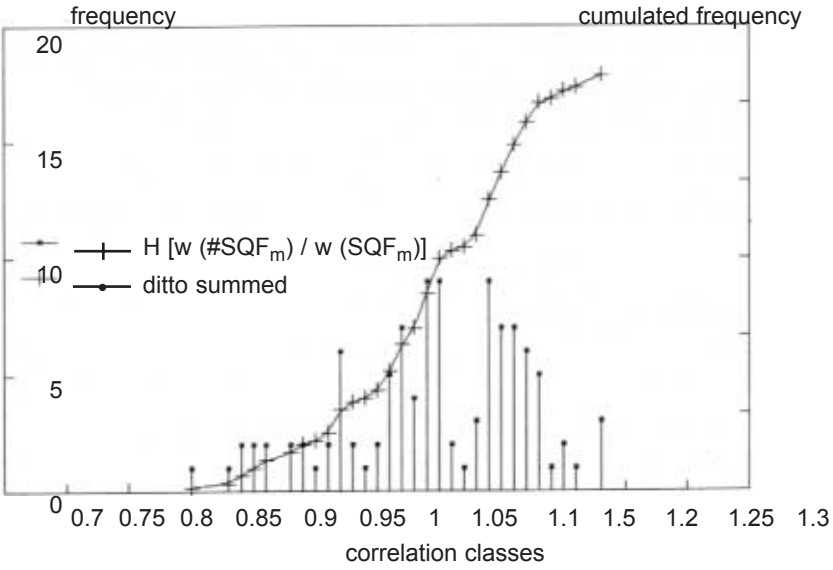


Fig. 5 Symmetry Statistics

The frequency diagram shown has a deviation of σ = 0.09 and an average value of 1.055. These values have to be used carefully since they only remotely resemble a Gaussian bell curve! For better orientation, additionally, the cumulated frequency has been determined and is also shown in the diagram. Now it becomes clear that the expected asymmetry is in favor of the mathematically positive direction of rotation (against the SQF_m).

Third Phase of Evaluation:

The analysis of the measurement values, and now also of calculated values, is further differentiated as follows: The maximum speed frequency to be utilized is increased and the matching quotients are determined. This is broken down in steps from 20 Hz to 300 Hz (18 000 r.p.m.) beginning at 20 Hz. The average value of all quotients determined is graphically shown in Fig. 6.

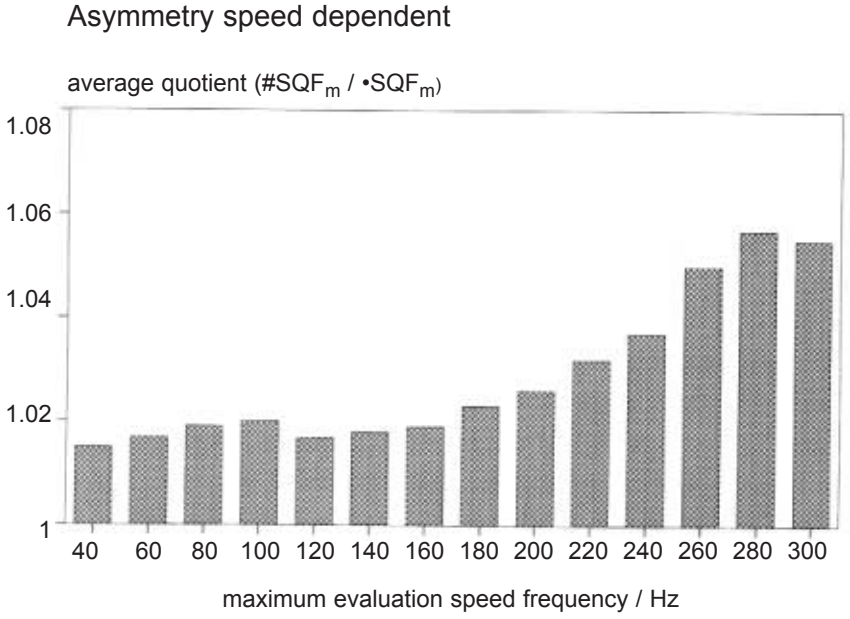


Fig. 6 Asymmetry Speed dependent

It is interesting, that the quotients determined, i.e. the behavior of the angles traversed, up to 160 Hz (9600 r.p.m.) is more or less constant at 1.01 to 1.02, whereas above that they rise markedly up to a maximum value of 1.054 at 280 Hz (16 800 r.p.m.).

Fourth Phase of Evaluation (Interpretation):

If the supposition should be correct, that the measured asymmetry depends on the strength of the field of the permanent magnet, then with stronger magnets interesting macroscopic effects should show up, depending on whether they rotate in one direction or the other. The inductivities and input devices available do not make it possible at this time to create sufficiently high magnetic flux densities around the cylinder. Thus above question could be of an academic nature. Is it allowed to speak of different angular moments, respectively, moments of mass inertia? Is it chance, or is there more behind this, that this maximum measured quotient almost exactly corresponds to the proportion of magnetic flux density (101 mT) versus the maximum possible polarization (maximum magnetic flux density in the material, minus μ 0 x H). (2.16 T) ^{3} ? (B/J = 0.101 T / 2.16 T = 4.6%; qmax = 5.7%) !?

Do these measurements have anything directly to do with the Einstein de Haas-Effect? I am wondering if anyone among the readers has carried out similar measurements or will do so. In the final analysis it is not 100% sure that a systematic error can be eliminated.

Literature quoted:

[1] Gerthsen / Kneser / Vogel: Physics, page 388, Springer-Publisher Berlin, Heidelberg, New York 1974 (in German).

[2] Experimental and Theoretical Foundations. Starts at page 183, Springer-Publisher Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong 1989 (in German)

[3] Koch / Ruschmeyer: Permanent Magnets 1 Foundations, Valvo, Management Division, Philips, Hamburg 1983 (in German).

2. Asymmetrical Magnetic Flux Density of Rotating Bar Magnets?

Continuation of the article “Asymmetrical Moments of Mass Inertia of Rotating Bar Magnets?” [1]

In connection with my measurements of different types of N-Generators (N-machines) for some time, I measured and stored, for systematic reasons, the axial magnetic flux density of rotating ring magnets. The measurements were supposed to answer the question whether or not, when the N-machine supplies current, the magnetic flux density was changing in any measurable way. With my so-called C-generator [2] I could definitely show a change in flux density of about 10 microTesla when short-circuited at 100 A. The measurement set-up consists of a rotating bar magnet in the form of an N-machine, coupled with a DC drive motor using an elastic hose clutch. Looking at the motor shaft one looks at the north pole of the magnet arrangement. With mathematical positive direction of rotation (counterclockwise) a positive electric potential, with respect to the shaft, shows up at the periphery. At a radial distance of 40 mm from the central shaft a Hall-Generator was placed having a sensitivity of 1 μV per 1 μT. This voltage from the Hall probe was periodically checked and stored using an IEC-Bus-controlled digital voltmeter. A subsequent analysis of the stored data showed a very interesting dependence on direction of rotation and speed, which had not been expected. (Fig.7 and Fig. 8).

Graphic Representation B_axial at the N-machine, Chr. Monstein March 7, 1991
BvonN69.MCD, Experiment No. 69 Rotation against SQF_m.

Speed :=READPRN (M0069X) Flux := READPRN (M0069Y1)

a := slope (speed, flux) N := length (speed) -1
b := intercept (speed, flux) I := 1 ..N

a = - 0.122 gradient in microTesla per r.p.m.

B_i := a x $speed_i$ + b

axial, magnetic flux density in μT for speed against SQF_m

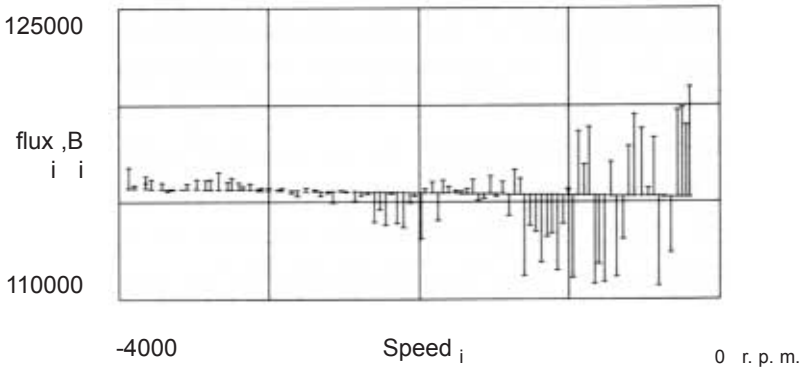


Fig. 7 [n against SQF_m]

Graphic Representation B_axial at the N-machine, Chr. Monstein March 7, 1991
BvonN70.MCD, Experiment No. 70 Rotation parallel to SQF_m.

speed :=READPRN(M0070X) Flux := READPRN(M0070Y1)

a := slope(speed, flux) N := length(speed) -1
b := intercept(speed, flux) I := 1 ..N

a = - 0.355 gradient in microTesla per r.p.m.

$B_i := a \times speed_i + b$

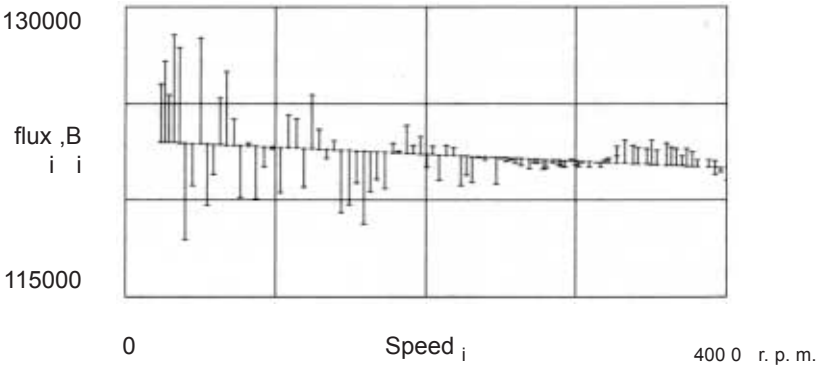


Fig. 8 [n parallel to SQF_m]

The graphic/numeric evaluation of the data using MATH-CAD [3] shows, that with positive speed (the atoms rotate in the same direction as CRANE's SQ flux) the magnetic flux density decreases as the speed increases. In the reverse case, I determined that with increasing negative speed (the atoms rotate against the SQF) the magnetic flux density increases. The gradient of the magnetic flux density dB/dn can be set up, which in the statistical average at the given conditions, amounts to about - 0.1 mT / r.p.m. or -6 mT / Hz. The deviation of the individual gradients determined is rather large for the following known reasons: First, the magnets having B0 = 120 mT are relatively weak. Second, the axial magnetic flux density of the magnets is not homogeneous. Third, there is a possible problem of interference between the scanning rate of the test device and the speed of the N-machine (Fig.9).

In Fig. 9. therefore, is shown the distribution of the calculated B-gradients. The reader himself should think about, whether and if so, the distribution function is reliable. In order to test this behavior, which is comparable to the Barnett-Effect [4], more measurements under controlled conditions should be carried out. The conditions are: Homogeneous bar magnets made out of non-conducting material (not using AlNiCo), high magnetic flux density, high speeds in both directions and a non-ferromagnetic environment.

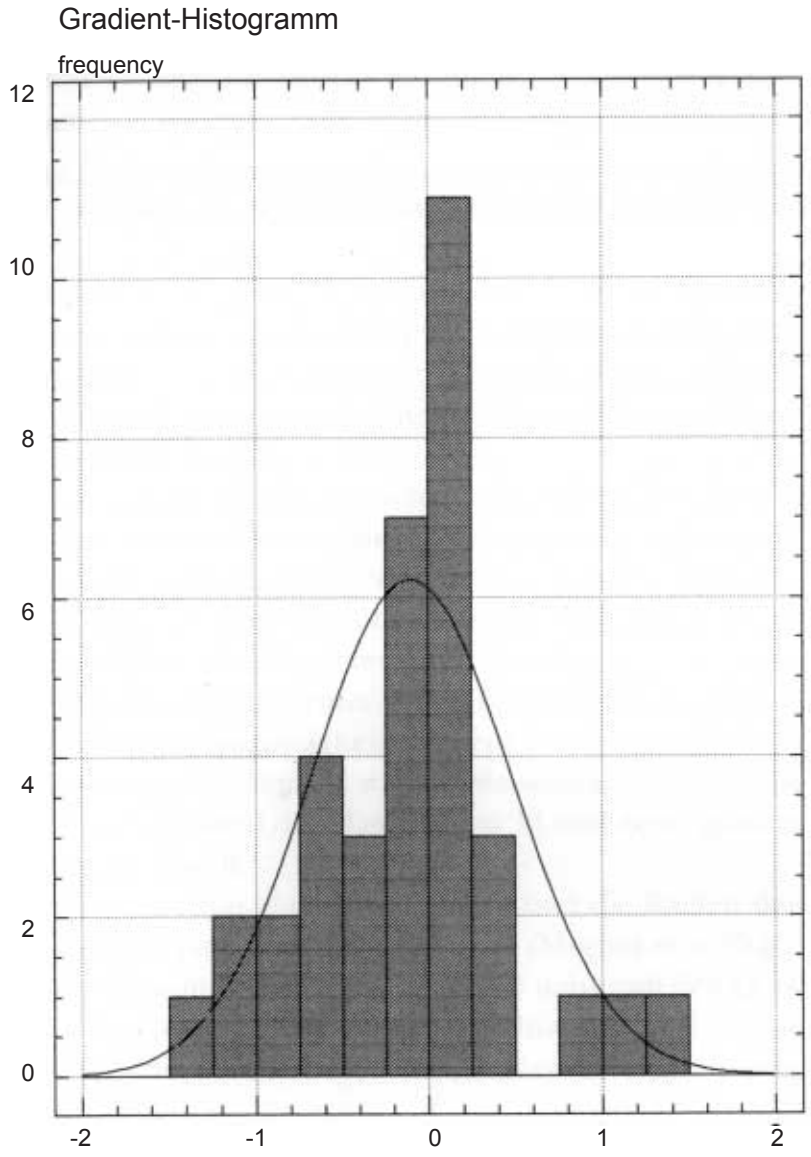


Fig. 9 Gradient Histogram

Literature:

[1] SAFE-News 3/4 1990, pages 17-22.
[2] SAFE-News 1 1989, pages 19-24.
[3] Math-CAD, Registered Trademark of Math Soft, Inc. Massachusetts.
[4] (S.J. Barnett, 1873-1956), 1914 first proven magnetization of an iron bar by fast rotation about its longitudinal axis.

3. Addition to Chapter 2 (above): Asymmetrical Magnetic Flux Density of Rotating Bar Magnets?

Additional complement to the published article ”Asymmetrical Moments of Mass Inertia of Rotating Bar Magnets?” [1]

The quotients determined in Section 1, with above title, being qmax = 1.054 (5.4 %) is, according to O. Crane, a parity violation caused by a relative motion of the space quanta flux SQF (ether?) against the atoms of the rotating magnetic object (see SAFE-News 1/2 1991).

However, this factor is very small, since the permanent magnet is not the only thing rotating. It is a combination of non-magnetic materials that is rotating (PVC, teflon, brass etc.). The parity violation on the other hand is only due to the influence of the magnet.

The kinetic energy of a rotating cylinder is proportional to the (mass) moment of inertia ‘J’ and the square of the angular velocity ‘w’ The moment of inertia itself is proportional to the mass ‘m’ or ‘M’ and the square of the radius ‘r’ or ‘R’. [2]

If the proportion of the masses and that of the radii of the non-magnetic parts is considered (magnet m = 35 g; r = 6 mm; total mass M = 54 g; R = 7.5 mm) and the quotient is calculated for the magnet only, then a much higher value is obtained in the order of 1.13 (13%).

I am interested to find out if anyone among the readers has had similar experiences and whether this value could be theoretically derived from somewhere....

Literature:

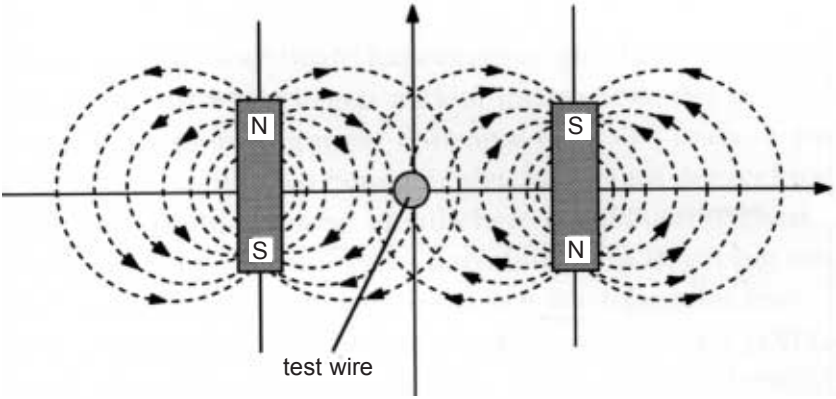
[1] SAFE-News 3/4 1990, pages 17-22.
[2] Kuchling, “Physics”, Formulas and Laws, Leipzig 1974 (in German).

4. Magnetic Induction without Magnetic Field?

Imagine an arrangement according to Fig. 10, with a wire standing vertically on the paper which is connected with a galvanometer further away, or in my case, connected to a highly sensitive microvoltmeter. This experiment was first published by Dr. W. J. Hooper in 1969 [1], yet without any reasonable explanation (for me).

First a permanent magnet is placed about half the length of the test wire away, either suspended on a thread or mounted on a non-ferromagnetic sled.

View from "above", showing the non-intersecting magnetic field lines



At the point x = 0 and y = 0 for all 'z', the magnetic flux density 'B' is at all times = 0 ! (The field lines of both magnets compensate, which can easily be proven with a Hall probe) The test wire is placed vertically with respect to the x- and y-axis.

Fig. 10 Hooper's Experiment

The north pole points down in the direction of y < 0. If this magnet is moved with a definite speed coming from the right on the x-axis towards the test wire, then a voltage will be induced in the wire (induction of motion) [2] according to the following formula:

$$u = \int (B \times V)\, dL = \int (B * V)\, dl \qquad B, V \text{ and } L \text{ orthogonal}$$

However, 'B' is not constant, but changes its strength, depending on the distance from the permanent magnet, almost exponentially. The analysis of the mechanical, geometrical relationships leads to the following, more explicit formalism, the derivation of which is not part of this documentation. We are solely dealing here with the orders of magnitude and quality of the voltage impulse.

$$u_i := -B_{max} \exp\left[-k\, x_i\right] va \int_{-Z}^{z} \cos\left[\operatorname{atan}\left[\frac{z}{x_i}\right]\right] dz$$

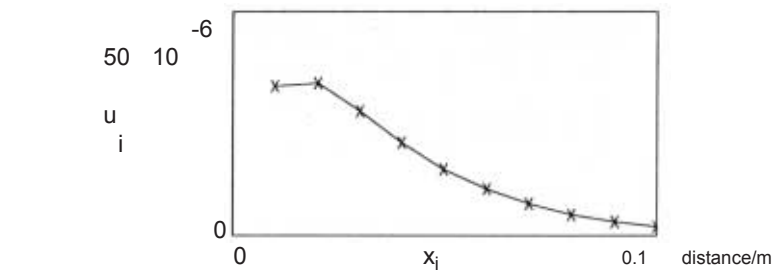


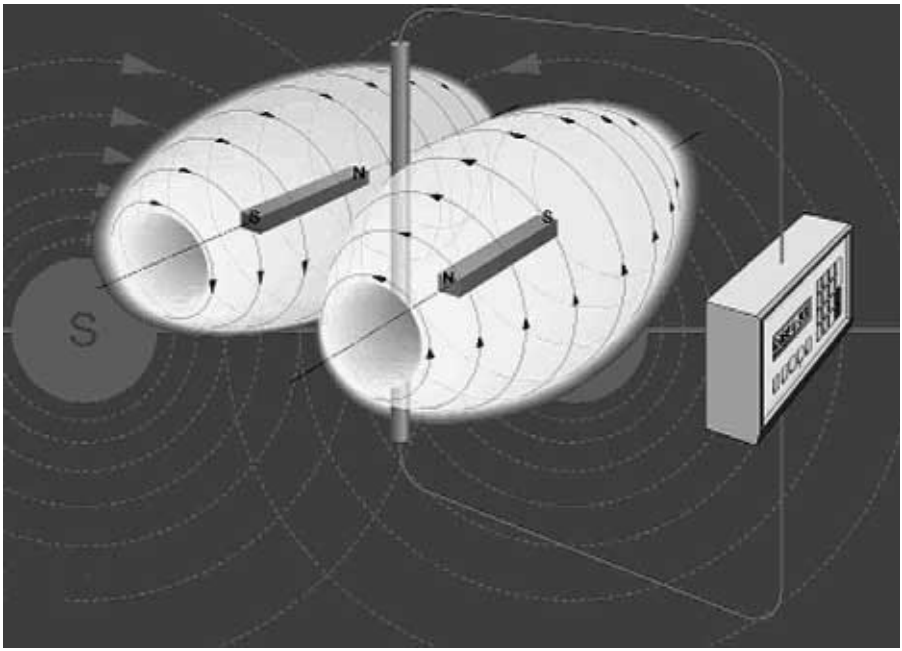
Fig. 11 [Titel ??]

Those interested may see the complete derivation and reason at the author's place.

Measurements with my metrology equipment have shown that the calculation is rather accurate, with a measurement error of about + / - 3 microvolts (which corresponds to + / - 10% of the values measured).

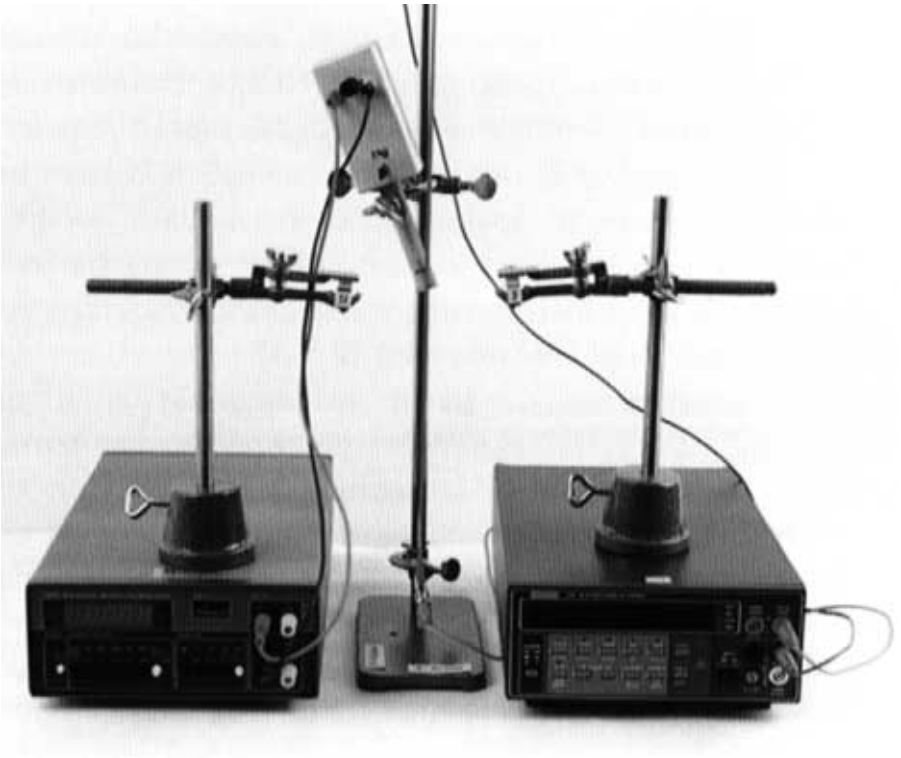
If we repeat this experiment, now moving the magnet from left to right at a definite speed being on the left side of the test wire, the north pole points backwards (y > 0), then the same voltage shows with the same time conditions since (B x V) is identical to (-B x -V). [3] Up to now nothing special has happened. This is the normal inductive behavior (at least up to the eighth semester of a technical school).

If, however we carry out both experiments at the same time, meaning we move the permanent magnet on the left side of the test wire (north pole at y > 0) to the right towards the test wire and at the same time we move an identical permanent magnet on the right side of the wire (north pole at y > 0) from right to left towards the test wire, using a defined speed, then we find the following: At the place of the wire it can be shown (with a Hall probe) that at any time and any height (axis 'z') the magnetic flux density is exactly = 0 ! As can easily be seen from Fig. 10, the field lines of the left and right magnet compensate each other to zero! However, now the induced voltage is, interestingly, not zero volts, but exactly double the value of the experiment with one magnet. In other words, we now measure the sum of the induction voltage of the left and right magnet, although the magnetic flux density at the place of the wire is zero.



Hooper-Monstein-Experiment (1992)

When simultaneously pushing the two bar magnets together against the test wire, the microvoltmeter shows double the voltage. And, using O. Crane's magnetic space-quanta-flux SQF_m this phenomenon can even be explained.



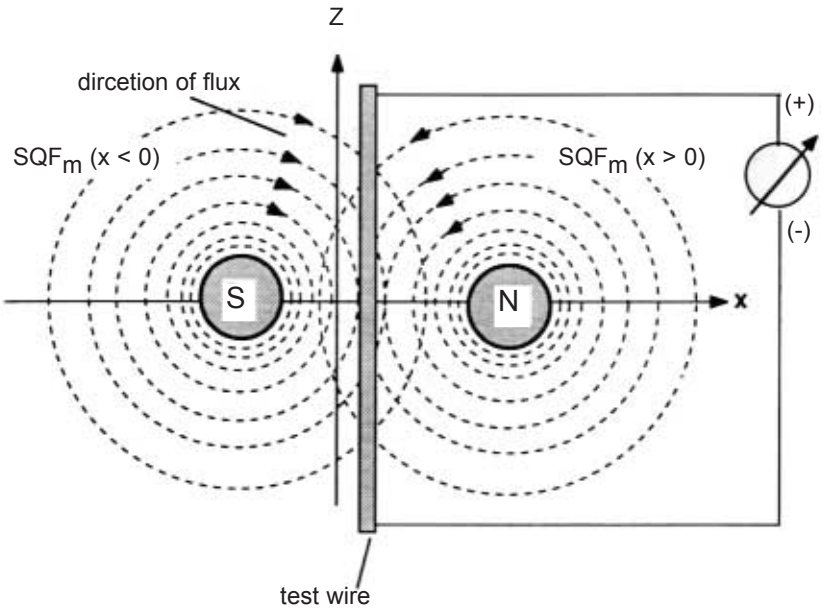
Hooper-Monstein-Experiment (1992)

Experiment repeated at the beginning of 1992 of Dr. W. J. Hooper's experiment (U.S.A., 1969). Frontal view showing microvoltmeter and HALL-Probe.
Proof of the Space-Quanta-Flux SQF_m according to O. Crane

This means, there is no effective ‘B’ and not at all any dB / dt, just as little as dF / dt. This means, it is impossible that ‘B’ is the cause for the induced voltage, it must be something else....

In our minds we now switch to Fig. 12.

View showing Space Quanta-Flux SQF_m according to O. Crane



At the place x = 0 and for all ‘y’ and all ‘z’ at any time the sum of SQF_m (x < 0) plus SQF_m (x > 0) is greater than zero, i.e. the flows are added. These flows (fluxes) push the free charge carriers in the test wire down (-z).

As long as the flows are not compensated the microvoltmeter will show a voltage.

Fig. 12

This view has been turned 90º and now we are looking at the y-axis and at the face of each magnet. No longer do we see the field lines according to Faraday & Company, but the flux lines of Crane's space quanta flux SQF_m. [4] According to definition the SQ "flow" counter-clockwise around the bar magnet, looking at the north pole. Looking at the south pole they logically "flow" clockwise around the magnet. In Fig. 12 it can easily be seen, that in this special configuration the SQF_m do not compensate each other as field lines do, but they do add to a double flux which can be correlated with the measurement of the double voltage at the test wire. It is just as easy to see the polarity of the "induced" voltage. As long as the flows and forces are not compensated (no stationary flux has formed around the free electrons) the SQF_m forces the free electrons to the lower end of the wire at $z < 0$ and there creates a high pressure of electrons. At the top of the wire a deficiency of electrons shows up. The instrument indicates a positive voltage during our experiment, given the conditions of the present configuration and direction of motion. If the stationary flux is reduced or taken away (by removing the magnets) then the front (flux)-pressure points of the free electrons will be relieved. Thus the free electrons receive an impulse from the rear pressure points in the opposite direction. If both magnets should be removed from the wire with the same velocity, electrons will again flow upwards and produce a negative voltage pulse at the connected instrument, which had been measured several times, although the magnetic flux density at the place of the wire was still zero!

In other words: The magnetic flux density is a purely calculated magnitude, it has nothing to do with reality. The reality is the space quanta flux according to Crane, which, however, is not as easily represented or shown as are field lines with the help of iron powder.

According to the latest research [5] there has been success to visualize the SQF_m ; I have been able to do it myself in the meantime (Ditchev-Experiment).

I now believe to understand the words of Stefan Marinov, which he casually mentioned to me, as he passed me during the SAFE-Congress in Einsiedeln in 1989 [6] :

“There are no fields, only potentials”!

According to O. Crane this sentence could be changed somewhat as follows:

“There are no magnetic fields, but only the magnetic space quanta flux SQF_m “!

Literature:

[1] New Horizons in Electric, Magnetic, and Gravitational Field Theory by W. J. Hooper, PhD, Tesla Book Company.

[2] Motional Electric Fields Associated with Relative Moving Charge by Kyle A. Klicker, Tesla Book Company.

[3] Electromagnetics by John D. Kraus, McGraw-Hill Book Company.

[4] Electric and Magnetic Field in the New Unified World View of Physics by O. Crane, SAFE- News 1/2 1991 (in German).

[5] German Physics, International Glasnost Journal on Fundamental Physics, Volume 1, No. 2 / 1992, Ditchev-Experiment, Stefan Marinov, Graz (alternates in German and English, each issue).

[6] Congress Volume International Congress for Free Energy, Einsiedeln 1989 (in German).

5. Visualization of Space-Quanta-Flux?

For generations physicists and electronic technicians have been handling permanent magnets and iron filings in order to visualize the magnetic field lines. S. Marinov would say, every child knows the typical picture of closed field lines from kindergarten or very likely has made experiments himself. In any case, there is no doubt that the field lines come out of the north pole and enter at the south pole. Looking at one of the poles, the iron filings show a nice radial pattern, where the filings in the center exit vertically from the pole surface, whereas at the edge of the pole they exit nearly horizontal, thus creating the well-known star pattern. (Please see the typical picture of this in Chapter 6. , Section 6.3 Magnetic “Attraction” and Repulsion, Fig. 7. ; also found in SAFE-News, page 37. [1]). Such pictures can be reproduced at any time without any due effort.

Hristo Ditchev describes in detail in his work that he has succeeded in a simple way to obtain concentric pictures using iron powder. He used a glass vessel for this purpose and a permanent magnet. The magnet is stood on its end. The glass bowl is filled with water and placed above the magnet creating a distance of 21 mm between the surface of the water and the pole surface. (Fig. 13).

Then with his fingers he rubs very fine iron powder carefully dropping it onto the surface of the water and within a short time concentric ring structures will form. But that should not be, it should show radial structures! I myself could not believe it, but obtained some iron powder [6] and began to experiment....

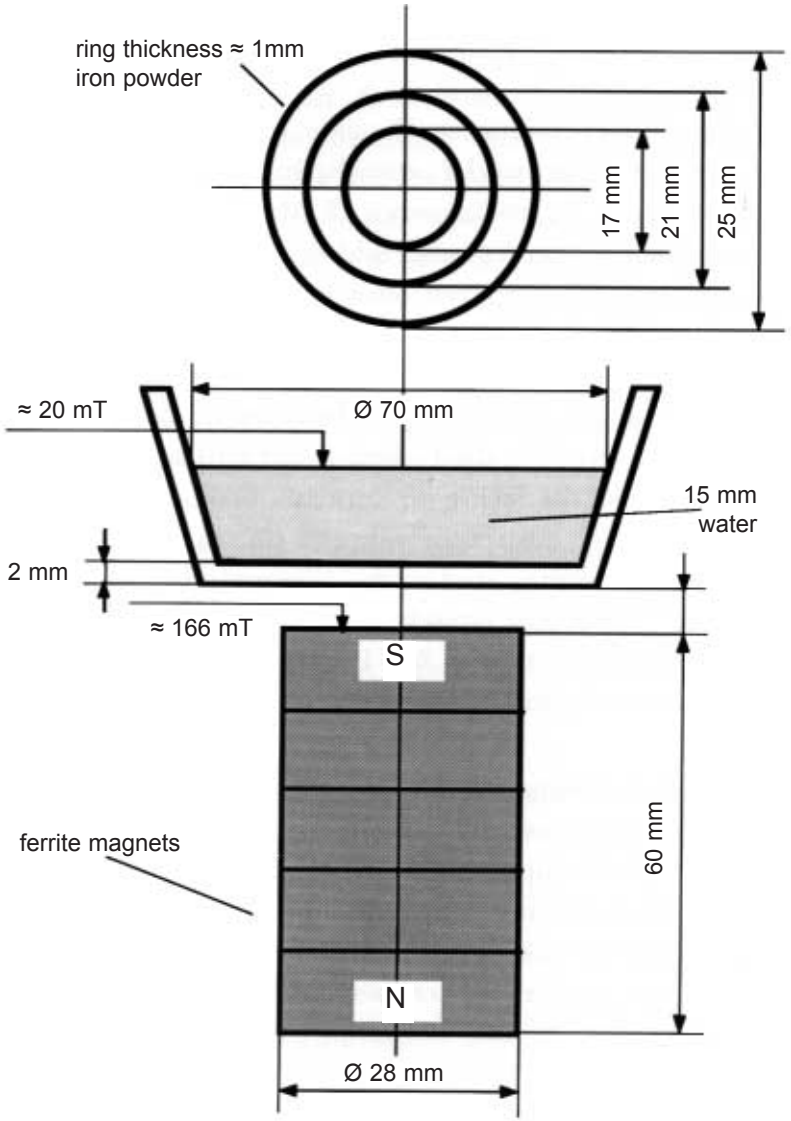
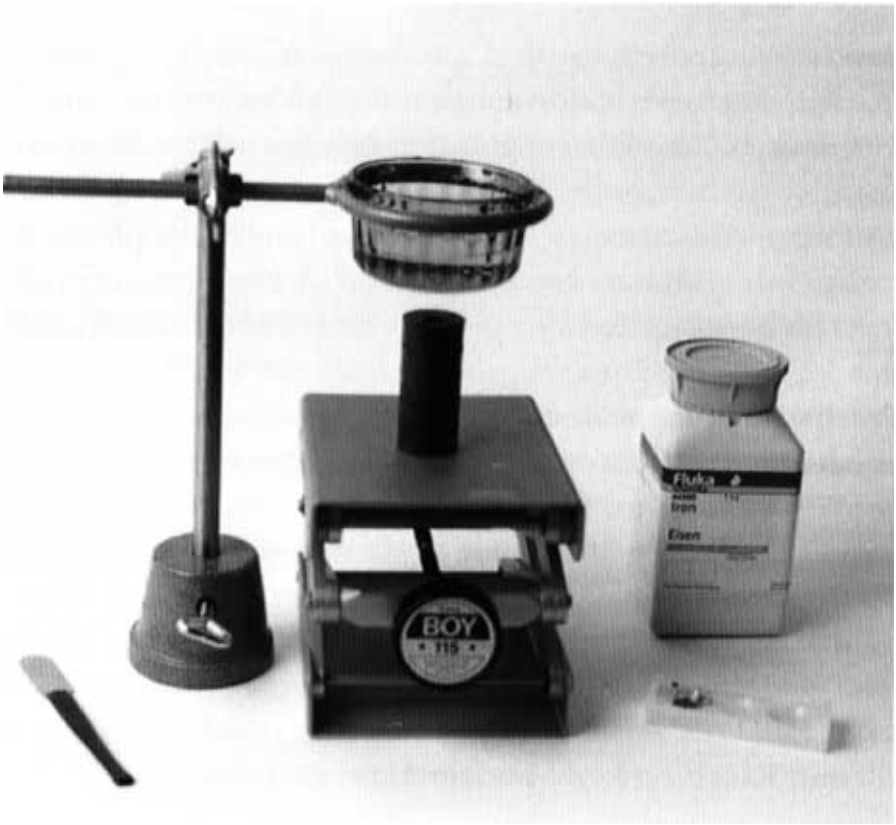


Fig. 13 Ditchev-Experiment Sketch



Ditchev-Experiment (1992)

Hristo Ditchev (Bulgaria,1991) Experiment, repeated by Chr. Monstein early in 1992. View from the front with iron powder and laboratory jack with ferrite magnets and water bowl.
Proof of the Space-Quanta-Flux SQF_m according to O. Crane.

All experiments were unsuccessful, either the powder clumped or adhered to the magnet or the old radial structures showed up. Was everything lies and deception? After 5 hours of systematic experimenting using different liquids, iron powder, nickel powder, cobalt powder, thin magnetic rods, thick magnetic block magnets, electromagnets, up to 50 variations I was ready to give it up. But around 23:00 hours it worked and fine concentric rings were obtained on the surface of the water. This needs clean, clear and cool water in a clean vessel. [7] The goal is to obtain and maintain a fairly large surface tension. The depth of the water in my arrangement amounted to about ten millimeters. Four millimeters below the glass bowl is placed a cylinder consisting of stacked ferrite magnets each 12 mm long and 28 mm in diameter

This magnetic cylinder is resting on a laboratory jack so that it can be slowly moved up towards the glass vessel. The magnetic flux density at the pole surface was about 165 mT and at the surface of the water it was about 20 mT. It is very important how the iron powder is placed on the surface of the water. Tools will not work. The best solution is that an almost invisible amount of iron powder is placed on the index finger and then using the thumb it is carefully rubbed at about 20 cm above the water surface. If the powder is too coarse it will sink immediately, if too much powder is taken it will coagulate. With a little bit of practice and the proper boundary conditons I am now able to repeat the effect at any time. And what does the concentric structure show?

It can not be a picture of the field lines, for these, as we know, should show a radial picture. According to Stefan Marinov [2] the rings are a picture of the magnetic vector potential ‘A’, which thus far only existed as a mathematical structure. According to O. Crane [1] the ring

structures are doubtless due to the influence of the space quanta flux SQF_m . They are a direct image of Crane's space quanta flux. For all ring structures around bar magnets this holds, that the mutual effect with the SQF is minimal (minimizing energy). It is also remarkable, that the ring structure will remain exactly in shape, even if the permanent magnet is carefully removed again. The structure clearly remained for over 15 hours, although the water was moved or shaken several times. The iron powder that had sunk to the bottom turned into rust. Obviously the ring structures were not even wetted due to the surface tension.

During the further course of the experiment I found out, that when the structure was slightly disturbed, the liquid, together with the iron structure, carried out microscopic to macroscopic circular movements. The disturbances were caused by individual iron kernels or direct shaking of the experiment or by different elevations of the magnet cylinder below the glass. For this reason I purposely caused some disturbances trying to find out its influence on the rotation. I made a total of 35 experiments with the north pole being up and 35 experiments with the south pole being up. Other experiments, in which the surface tension was, by design, destroyed with sodium-tripolyphosphate (detergent), neither improved nor deteriorated the total result.

Remember, looking at the magnetic north pole the SQF_m flows counterclockwise around a bar magnet (mathematically positive), and looking at the south pole the SQF_m flows clockwise (mathematically negative). Fig. 14 shows the result in graphic form.

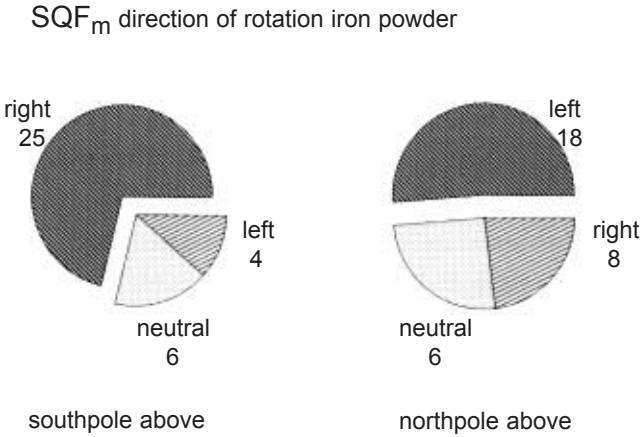


Fig. 14 SQF_m Direction of Rotation, Iron Powder

It seems as if the SQF_m prefers to force the iron dust in the very direction the SQF_m flows, as O. Crane said. Systematic errors in these types of experiments can not be entirely eliminated, so the results should be interpreted with the necessary caution! However, I do believe that I can recognize parallels to the "Toroid-Ring-Vortex" Theory of Dr. Ing. Jakob Huber. [4]

Literature and Details:

[1] SAFE-News, Volume 4, No. 1/2 1991, page 37, Electric and Magnetic Field by O. Crane.

[2] Visualization of the Magnetic Field with the Help of Iron Dust, by Hristo Ditchev, published in German Physics, International Glasnost Journal of Fundamental Physics, Stefan Marinov, Volume 1, No. 2 April-June 1992 (alternates in German & English, each issue).

[3] European Journal of Physics (12,101, 1991).

[4] Congress Volume International Congress for Free Energy, Einsiedeln, 1989, Dr. Ing. Jakob Huber, The Toroid-Ring-Vortex as a Model for Conversion of Free energy, pages S8-0 to S8-16.

[6] Exact designation of iron powder as per FLUKA-Catalog Iron [Carbonyl-Iron Powder], Fe Mr 55.85 44900 purum DAB, reduced; > 99% (RT); Ferrum reductum).

[7] Other suitable liquids are:
- Photo positive developer for conductor plates (2.7% sodium hydroxide, 0.7% Lithium hydroxide, 0.5% sodium tetra borate).
- cold water saturated with sodium chloride (table salt).

6. Parity Overthrow of Rotating Steel Cylinders? The Barnett / Monstein-Effect (1992)

A proposal was made by Jean-Marie Lehner [1] for confirmation of the SQF-Theory of O. Crane. [2] The following experiment was carried out in the SAFE-Laboratory of the author. According to O. Crane, the experiment only shows a variation of the "Monstein-Effect" [3]. In this experiment, essentially the tests of S. J. Barnett [4] were repeated with new and different view points. Mr. Barnett describes in one of his publications clearly, that differences in the magnetization caused by a left / right-rotation are a consequence of systematic errors. Errors due to oscillations, contractions, inhomogeneities, earth magnetic field etc. He rejects all measurements with different results when changing rotation or uses them for statistical error correction. The theory by O. Crane, however, precisely predicts that a change in the direction of rotation will macroscopically show in the polarity of the ensuing magnetic field.

In all our considerations for describing the direction of rotation and the magnetic field, we always look at the face of the ST 37-cylinder (round steel as per DIN 1027, German Industrial Standard). If the cylinder rotates clockwise then all electrons involved (the spin -rotation of which is unidirectional with the direction of rotation of the cylinder) will receive an additional angular impulse which also increases their mutual action with the SQ, thus producing a stronger spin-SQF. The spin magnetism increases with electrons, whose north pole is directed towards the face of the cylinder. In this case the HALL probe will register a north pole. The analogous event takes place with electrons, if the cylinder rotates counter clockwise (mathematically positive), whose south pole is pointing to the face of the cylinder.

The opposite happens to all electrons whose spin-rotation is counter to the rotation of the cylinder, which means electrons, whose south pole is pointing towards the face, if the cylinder rotates clockwise. Their angular momentum decreases and thus the mutual action with the SQ, which correspondingly weakens the spin-SQF (spin-magnetism). The analogous process occurs if the cylinder rotates counterclockwise, with electrons pointing their north pole towards the face of the cylinder.

According to the definition, at this point, we would like to bring to mind the following facts: First, the Barnett-Effect (just as the “Monstein-Effect”) can only occur in ferromagnetic materials. Second, with negative elementary particles the SQF moves opposite to the direction of spin-rotation. Third, looking at the north pole, the SQF moves counterclockwise (mathematically positive). Fourth, looking at the south pole, the SQF moves clockwise. We are not talking here about a magnetization in the normal sense of the word, but about a display of the “Monstein”-Effect. This magnetization only exists during rotation and disappears completely, so that when standing still the original state has been reached once more. With conventional magnetization, however, as is known, Weiss’s Fields are parallel oriented (flipped) inside a strong external magnetic field. After turning off the external field, a large part of these Weiss Fields remains in a parallel direction (residual induction). The intensity of the SQF (magnetic field strength) is determined by: The number of electrons involved, whose spin-rotation direction is unidirectional with that of the cylinder; by the spatial density of the electrons; and by the speed of the steel cylinder.

Barnett / Monstein-Experiment (1992)

Barnett / Monstein-Experiment (1992). Detail photo with the Faraday cage for shielding sources of interference. Proof of the magnetic space-quanta-flux SQF_m according to O. Crane showing polarity change with left or right hand rotation of the steel cylinder (using steel ST 37) at 2580 r.p.m. .

The first experiments all turned out negative. I had used 8 mm thick cobalt steel and 8 mm thick ST-37 steel in a surface milling machine at 11 000 r.p.m. . Then I found out that the velocity of peripheral valence electrons, at most, amounts to 4.6 m / s, which I could not handle with the equipment I had. After consulting with O. Crane my mechanic H.P.Benz machined a new ST-37 cylinder of 44.7 mm diameter and 72 mm length. This cylinder was chucked into a modified drill press (Fig. 15) and allows reasonable measurements within the framework of my equipment.

The drill press also had to be modified so that the direction of rotation could simply be changed using a switch. Unfortunately we had no frequency changer available so that we could only measure speeds as given by the discrete r. p. m. supplied by the belt drive. Since the speeds given on the nameplate are not calibrated, I used an infrared sensor in addition to determine the speed, feeding the signal into a digital frequency counter. This also makes it possible to record the entire measurement process on a personal computer through the IEEE 488-bus.

After many unsuccessful experiments (Reason: Wrong materials, speeds too low, Hall probe not sensitive enough etc.) we carried out 173 plausible experiments at different speeds. The test cylinder, as well as the HALL-sensor and the calibration coil were protected by a Faraday cage made out of chicken wire. This would, at least partially, shield any external electromagnetic interference. Even then an SER (South East Railway, of Switzerland) train passing by at a distance of about 30 meters could be registered, indicating about 10 mT. Measurements having been influenced by such interference were consequently eliminated.

Barnett / Monstein-effect (1992)

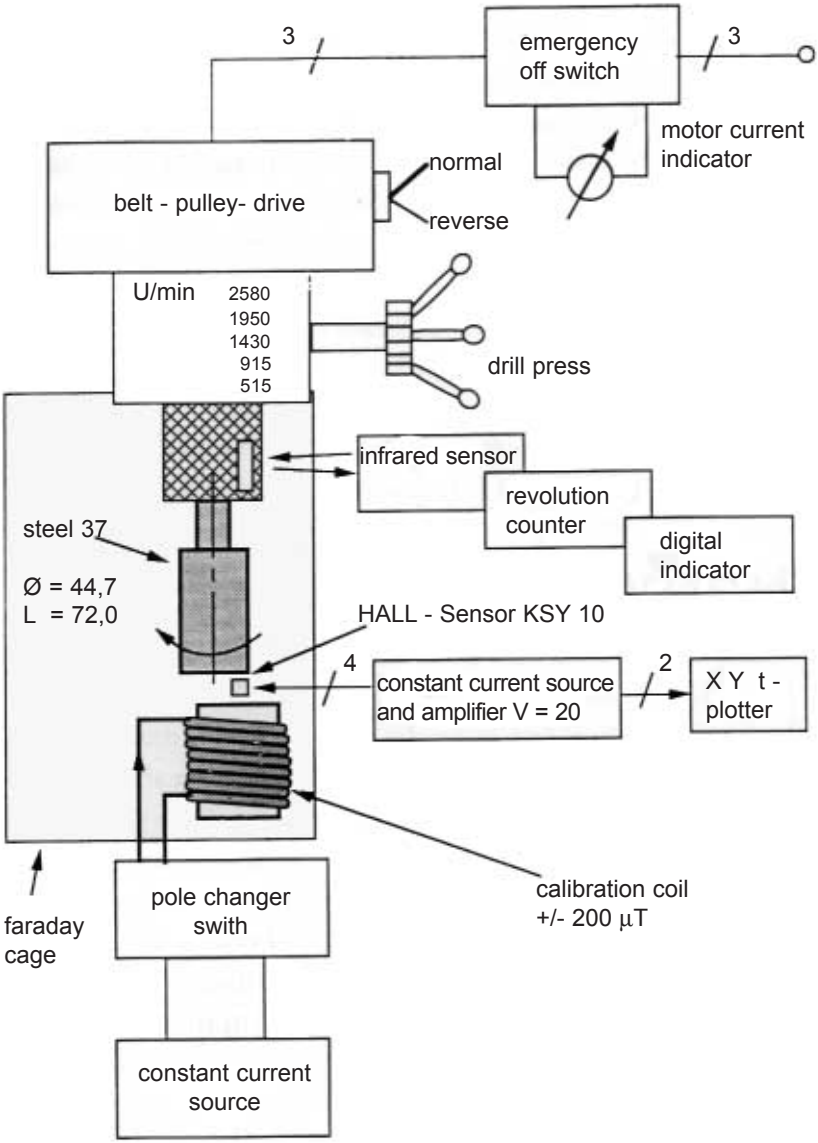


Fig. 15 Barnett / Monstein-Effect Test-Setup Sketch

The evaluation of the 173 tests is shown in Fig. 16.

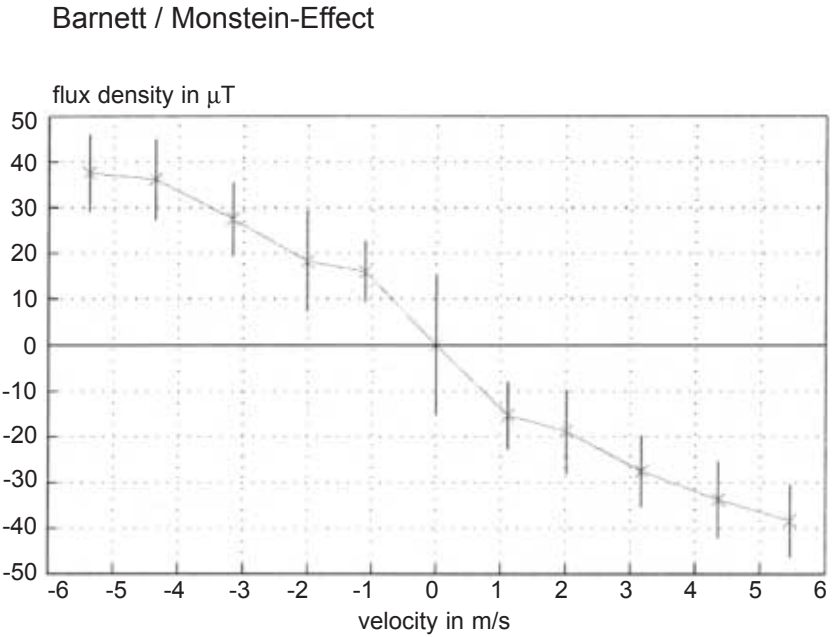


Fig. 16 Barnett / Monstein-Effect Test Diagram

The abscissa shows the velocities of the peripheral valence electrons, at the place where the HALL-probe is located, the range being - 6 m / s to + 6 m / s. The ordinate shows the measured magnetic flux density in the range of + / - 50 mT (microTesla). The meassurement uncertainty of the magnetic flux amounted to about + / - 5 mT + 105 of the measured value. The sensitivity of the magnetic field measurement is calibrated before and after each test using an air coil right below the HALL sensor, being fed with constant current. The coil produces a field of 4 mT per ampere. The constant current on the average is 35 mA creating a flux density of 140 mT. The polarity (north or south pole) can easily be checked with a pole changer switch. A reminder: The earth magnetic field amounts to, depending on the latitude, about 30 mT to 50 mT ! Besides the actual values which are connected by a line, with each measurement the value + / -1 sigma (standard deviation) has been entered. This allows conclusions about the quality of the tests. The number of measurements per speed range was so selected that the deviations of the measurements over all ranges were approximately equally large.

The most critical measurement is obtaining the absolute zero point. Since it was not possible to obtain it as absolute as desired, I determined the zero point statistically as an average value of all measurements. This is a relative zero point determination. Even for another reason this test is somewhat problematic. The steel cylinder is not fully magnetically homogeneous at its periphery, inspite of several demagnetizations using decaying alternating current impulses. Different flux densities had been noticed depending on the different angular positions. The statistical evaluation of the measured data results in a “virtual” zero point.

SAMPLE.MCD Barnett Experiment with Data Logging via IEEE 488-Bus and PC
Christian Monstein, March 22, 1992.

X := READPRN(U0006X) Read Speed

Y := READPRN(U0006Y) Read HALL-Voltage

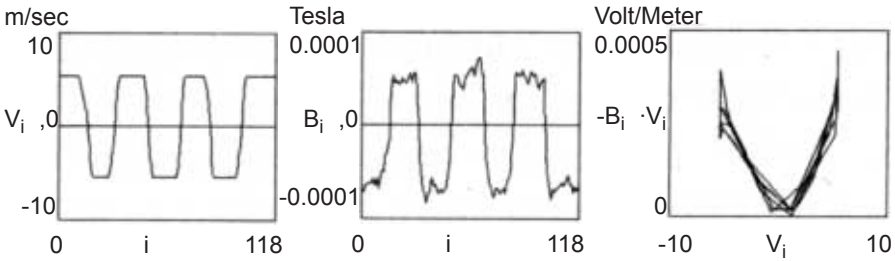
L := length (X) L = 119 I := 0 ..L - 1

Conversion: Speed into Velocity

$$V_i := x_i \cdot 2 \cdot \pi \cdot \frac{0.02135}{60}$$

Conversion: HALL-Voltage into Magnetic Flux Density

$$k := 2 \cdot \frac{0.000142}{1.53} \qquad B_i := Y_i \cdot 10^{-6} \cdot k$$



corr (V,B) = -0.982

Correlation Factor Velocity vs. Flux Density

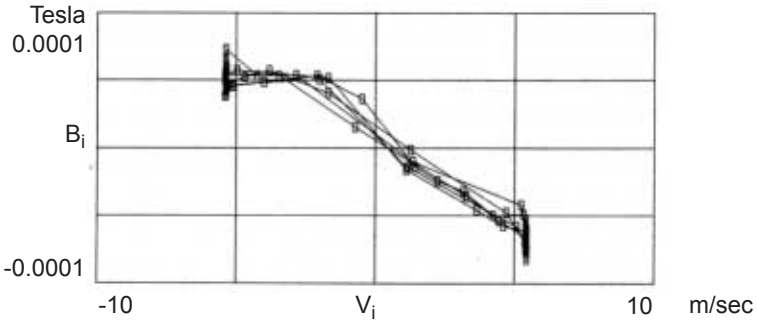


Fig. 17 Barnett-Experiment Data Logging

At this time, regrettably, I can not tell whether this is permissible to do. The measurement with an Absolute-HALL-Sensor indicates that even the test cylinder itself shows a residual induction of less than 100 mT. However, the chuck of the drill press stubbornly (inspite of several demagnetizations) keeps its residual magnetism of about 1.5 (+ / - 0.1) mT. Inspite of the contrary circumstances, the general trend is clearly to be seen as a gradient of dB / dV of approximately -7.8 mT per m / s and in this point completely confirms the SQF-theory.

A relationship is also obvious to the experiment “Asymmetrical Magnetic Flux Density of Rotating Bar Magnets” [5]. (See also Section 2. of Part 3.). At that time a gradient of - 0.1mT per r. p. m. was published. Subsequent conversion of those non-uniform data shows, the velocity at the measurement station was WR = 16.8 m / s. The new analysis with respect to velocity results in a gradient of about 24 mT per m / s which is 3.1 times higher. In this test also the magnetization only changes depending on the rotation. When standing still, the initial condition will be reached again. In this case also Weiss Fields can not flip. The efficiency for the asymmetrical behavior is determined by the volume of the rotating object and will increase 8-fold, if, for example the length is doubled as well as the diameter. All involved spin-electrons with their SQF, affect the same axis of rotation. The difference in the gradients therefore, can not be due to the greatly different magnetizability (mr) of ferrite compared to the (ST 37) steel. According to the Reference Data for Radio Engineers [6] , Swedish steel has a mr about 250, Mn-ferrite however, a value of 1000. There could have been a reason for this factor, if Weiss Fields had been involved. If the volumes at each place of measurement of the steel cylinder and the N-machine are compared to the experiment described under 2. “Asymmetrical Magnetic Flux Density of Rotating Bar Magnets [5] , then a quotient of 4 results, which

is within the measurement uncertainty. An extra problem is, that all measurements are greatly influenced by instabilities and uncertainties. In order to reduce instabilities, a DICKE-radiometer [7] was placed (after 120 tests) between the HALL-sensor and the indicator to minimize thermal drift and contact voltages. The radiometer also allows to integrate and/or filter the test signals. The filter time for above measurements amounts to about 0.1 sec.

Literature

[1] Universal Expert Publishers, J. M. Lehner, Kniestrasse 9,CH-8640 Rapperswil / Switzerland

[2] SAFE-News No. 1/2 1989, O.Crane, “What is it that keeps the world together at the core?”

- SAFE-News No.3/4 1990. O.Crane “The Central Oscillator and the Space-Quanta-Medium”.
- SAFE-News No.1/2 1991, O. Crane, “Electric and Magnetic Field”.
- SAFE-News No. 3/4 1991, Monstein, “Visualization of the Space Quanta Flux?”
- Space and Time, No.56, O.Crane, “Fundamentals of a New Physics (I)”.

[3] SAFE-News No.3/4 1990, Monstein, “Asymmetrical Moments of Mass Inertia of Rotating Bar Magnets?”

[4] Proc. Amer. Acad. 75 (1942), S. J. Barnett, “New Researches on Magnetization by Rotation and the Gyromagnetic Ratios of Ferromagnetic Substances”.

[5] SAFE-News No.1/2 1991, Monstein, “Asymmetrical Magnetic Flux Density of Rotating Bar Magnets?”.

[6] Reference Data for Radio Engineers, ITT 1982.

[7] DICKE-Radiometer, an instrument from Radio Astronomy, e.g. O. Hachenberg/ B. Vonwinkel, Technical Fundamentals of Radio Astronomy, pages 124 to 146, Bibliographical Institute Mannheim/ Vienna/Zurich, ISBN 3-411-01645-0 (in German).

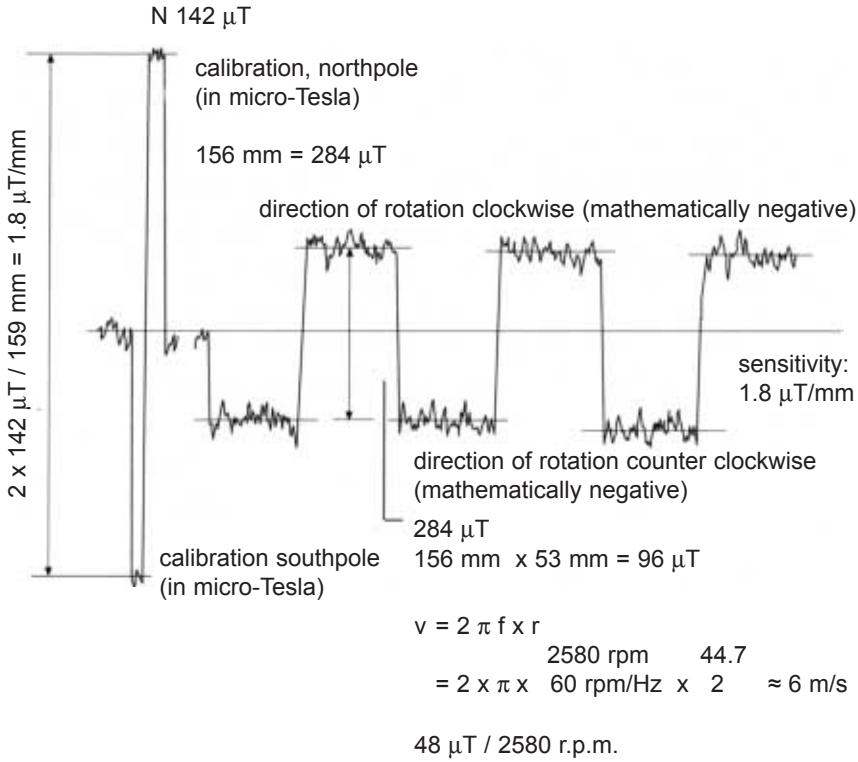


Fig. 18 Test Graph for the Barnett / Monstein-Experiment No. 22

7. Parity Overthrow of Rotating Bar Magnets?

The results mentioned in SAFE-News 3/4 1990 [1] and 1/2 1991 [2] led to the idea that stronger magnets would produce a stronger "Monstein"-Effect than those achieved with those rather small magnets. In the first experiment there was a poor relationship of effective magnet-mass to the total mass of the rotating system. For this reason J. M. Lehner ordered three special magnets in the U.S.A. with 50 mm (2 inch) diameter and 75 mm (3 inches) in length made out of neodymium-iron-boron. Each of these magnet cylinders weighed about 1.2 kg. Two of the magnets were magnetized by the manufacturer and showed a measured pole strength of 500 mT - 600 mT. The third cylinder was not magnetized and serves as a test reference for comparison, as well as a help for mounting purposes.

My radio friend H. P. Benz again, unselfishly produced and provided the bearings (self aligning), supports, base plate and a machined PVC pipe so we could run a new test series. The test set-up (Fig. 19) was improved and the appropiate software was modified, so that the personal computer could automatically select the direction of rotation of the drive motor, automatically start linear acceleration, record speed in real time and integrate the number of revolutions. The drive motor still has to be applied by hand so that the strong magnetic forces of the permanent magnet do not tear the motor from its mountings! Up to the time this article was written a total of 342 tests had been run, however the first 60 were not used for evaluation for these reasons:

Metrology Setup “Monstein-Effect“ 31. Aug. 1992
using neodymium-iron-boron magnet cylinder of 1,2 kg

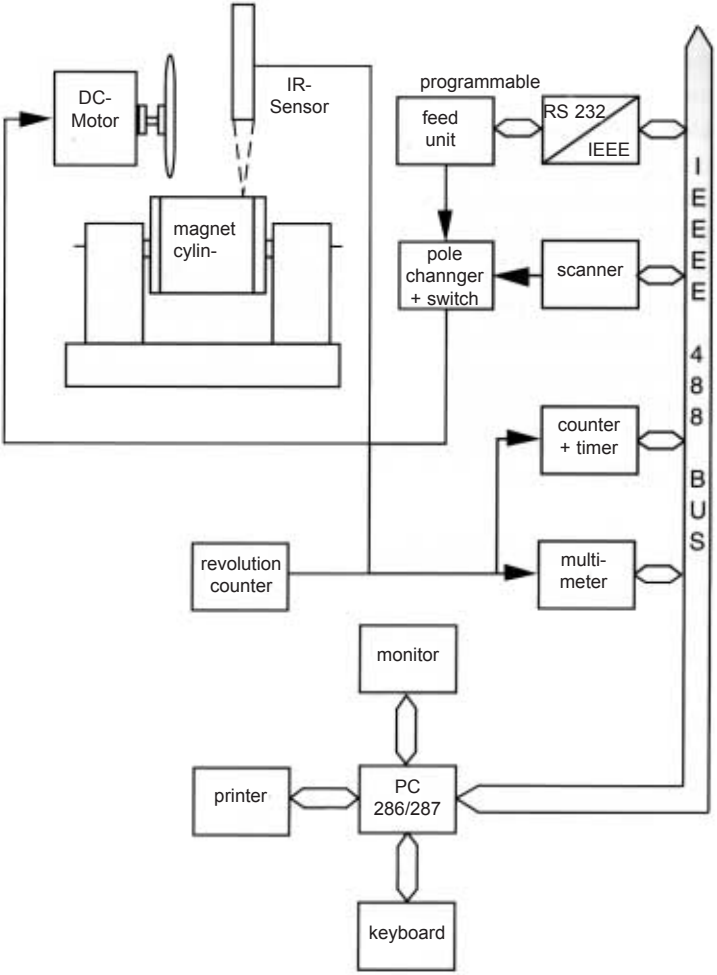
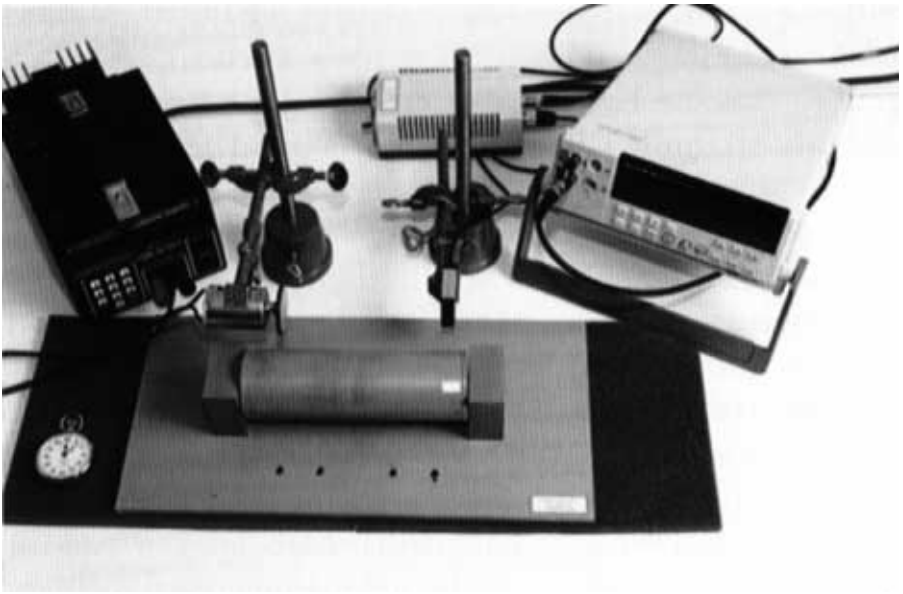


Fig. 19 Electrical-Mechanical Block Diagram of Test Set-Up



Monstein-Experiment using Neodymium-Iron-Boron-Magnet Cylinder (August 31, 1992)

Neodymium-Iron-Boron-Magnet Cylinder weighing 1.2 kg (inside PVC-pipe), diameter 50 mm x 75 mm length, running 600 r.p.m. clockwise and counterclockwise. Proof of the magnetic Space Quanta Flux SQF_m according to O. Crane.

First, the software had to be optimized for the initial tests, the test range, and units also had to be determined. Second, it was found out that the bearings had to be properly broken in. Third, the speeds had to be successively stepped up during the first few tests from 3000 r.p.m. to 4000 to 5000 and to 6000 r.p.m. (100 Hz). For safety reasons (homogeneity of data), the speed range is somewhat reduced for the evaluation. Instead of using 100 Hz down to 0 Hz, only 90 Hz to 15 Hz were used. Unfortunately it was found out that data for edges is often not homogeneous or non-linear. The measurements are always carried out in pairs, i.e in groups of two, four or six. More than 6 tests one after another are not possible at this time, or else the programable feed unit and the drive motor would overheat. Experiments with even test numbers turn against the flow direction, according to O. Crane. The odd numbered tests turn unidirectional with SQF. The stored data (ASCII-File) is sent off-line to another computer for further processing (Fig. 20). Then the data is accumulated and presented graphically (Fig. 21), similarly as shown under SAFE-News No. 3/4 1990 [1], and also in Section 1. of Part 3 in this book. Sets of data that have been corrupted are ignored and are not used for any evaluation.

Test Series with magnetized NdFeB-Magnet 500 mT - 600 mT

The analysis of the test data shows an interesting behavior, compared to the former test with an AlNiCo-bar magnet [1] . The statistical values such as average value, deviation and extremes are much better.

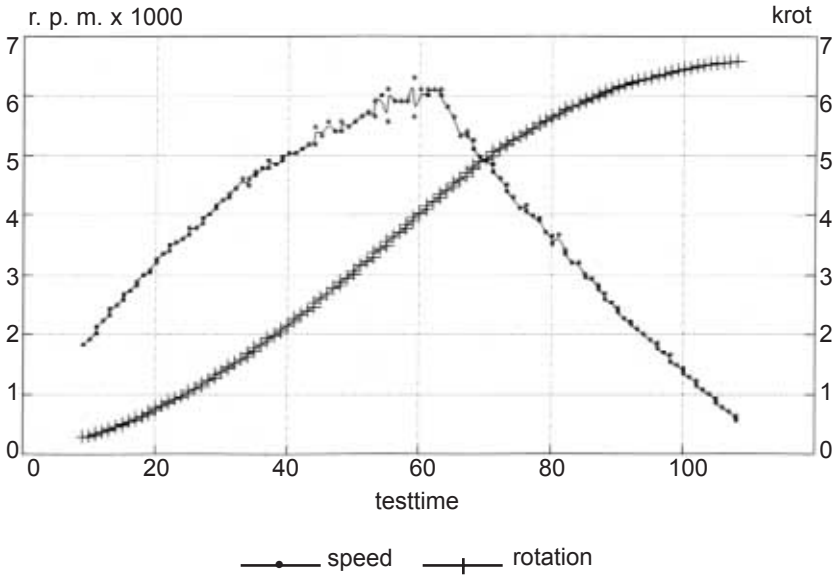


Fig. 20. Speed Range of Test as a Function of Time. Drive Motor (DC) applied manually, coasting freely

However, the amount of asymmetry of 9.8% = +4.5% with a deviation of 1.7%, only varies marginally from the first test with an asymmetry of 11% = +/- 5.5% at a deviation of 9%. This indicates that the effect does not, or only to some small extent, depend on the magnetic flux density and not on the mass either. In my opinion, the reason, from Section 1, of Part 3[1] must be reconsidered, namely that this result very obviously shows exactly the same value as the maximum flux density (0.5 T - 0.6 T) to the maximum polariztion (according to the data sheet 10.8 T), which is 0.55 T / 10.8 T = 5% !

Rotational Behavior
<> SQF / = SQF

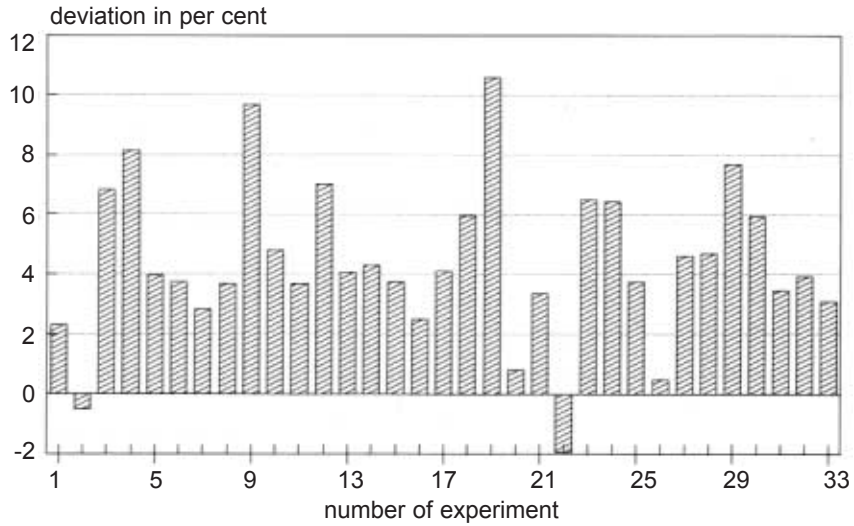


Fig. 21. Coasting Quotient (number of revolutions) against the SQF vs. Coasting (number of revolutions) with the SQF in per cent sequentially by occurrence.

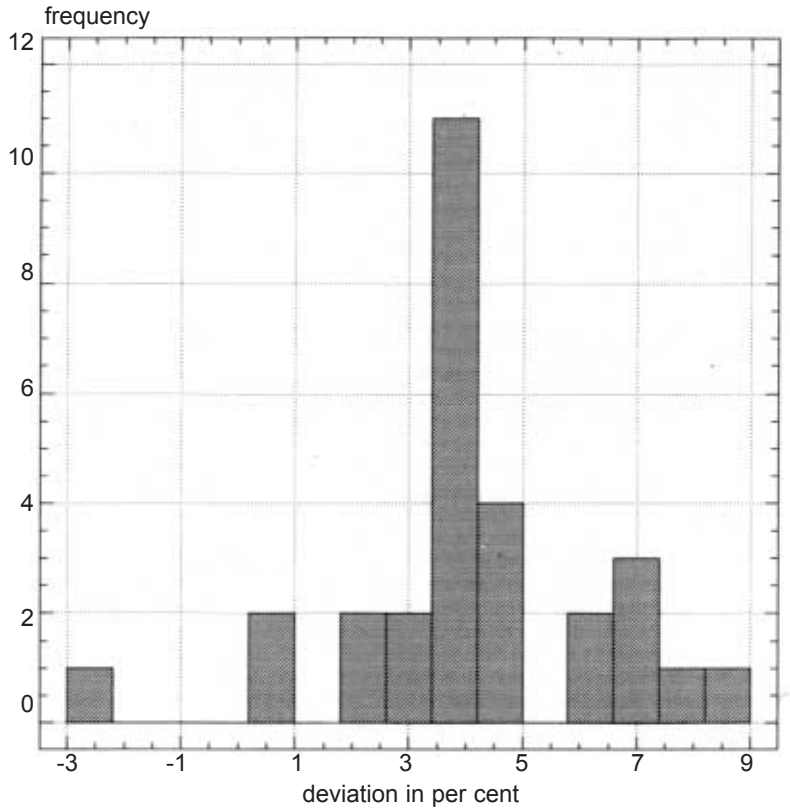


Fig. 22. Histogram of Quotients. Practically all tests are not symmetrical to the neutral axis at zero.

TOMP.MCD Christian Monstein Sept. 3, 1992

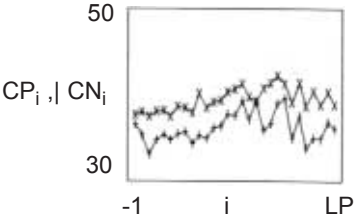
Analysis of Coasting Times of Magnet Cylinder for Frequency Range from 90 Hz to 15 Hz

$CP := READPRN(Tpos)$ $LP := length(CP)$ $LP = 29$ $i := 0 \ldots LP - 1$

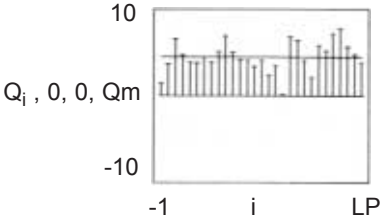
$CN := READPRN(Tneg)$ $LN := length(CN)$ $LN = 29$

$$V_i := \frac{|CN_i| - CP_i}{|CN_i| + CP_i} \cdot 100 \quad Vm := mean(V) \qquad Q_i := \left[\frac{|CN_i|}{CP_i} - 1\right] \cdot \frac{100}{2} \quad Qm := mean(Q)$$

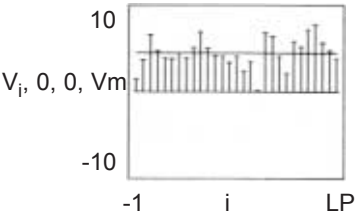
coasting between Fh and FL



coasting time quotients



quotient from difference/sum



$Qm = 4.54$ % $\min(Q) = 0.128$

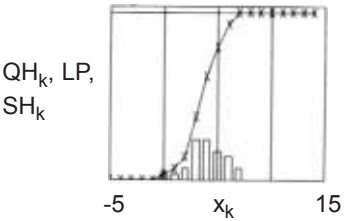
$Vm = 4.31$ % $\max(Q) = 7.714$

$stdev(Q) = 1.71$ $\min(V) = 0.127$

$stdev(V) = 1.57$ $\max(V) = 7.162$

$N := 20$ $k := 0 \ldots N - 1$ $x_j := -5 + j \cdot \frac{20}{N}$ $j := 0 \ldots N$ $QH := hist(X, Q)$ $h := 1 \ldots N - 1$ $SH_0 := QH_0$

frequency distribution (%)



$SH_h := SH_{h-1} + QH_h$

$WRITEPRN[VT_{PRN}] := V$

$WRITEPRN[QT_{PRN}] := Q$

Fig. 23 Analysis of Coasting Times of Magnet Cylinder for Frequency Range from 90 Hz to 15 Hz

Or has the small difference perhaps something to do with the velocity of the SQF? In all other tests the rotational velocity of the cylinder periphery is only 15 m / s . The end result (Fig. 22) is not materially different, whether one uses the number of integrated revolutions for the analysis or the time elapsed in coasting. It was found that the deviation band-width (sigma) is significantly smaller with the coasting times than with the number of revolutions. For this reason, in any further evaluations, only the coasting times will be used.

Literature

[1] SAFE-News No. 3/4 1990, “Asymmetrical Moments of Mass Inertia of Rotating Bar Magnets?”, Christian Monstein.

[2] SAFE-News No. 1/2 1991, “Addition to the Publication ‘Asymmetrical Moments of Mass Inertia of Rotating Bar Magnets?’”, Christian Monstein.

[3] Hideo Hayasaka and Sakae Takeuchi, Anomalous Weight Reduction on a Gyroscope’s Right Rotations around the Vertical Axis on the Earth, Physical Review Letters, Volume 63, Number 25, 18 December 1989.