LONGITUDINAL ELECTRODYNAMIC WAVE EXPERIMENTS

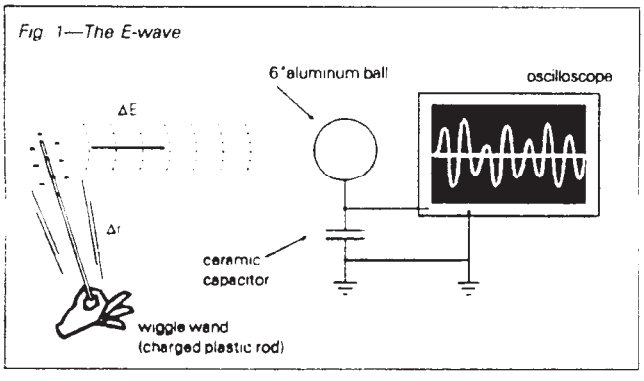
By Charles A. Yost, originally printed in *Electric Spacecraft Journal*, vol 12, 1994, pp 18-19.

This article describes continued electrostatic experiments using a charged plastic rod, called the "wiggle wand," which add to experiments conducted in 1993. This continuation was prompted by a Russian patent application (see article this issue, page 20) provided to me at the Institute for New Energy's conference in Denver in May 1994.

The Russian international patent (PCT/GB93/00960) was filed on May 10, 1993 by Stanislav and Konstantin Avramenko of Moscow. It is a straightforward application of the single-wire electrical energy transmission based upon the principle of longitudinal electrostatic waves as described by Nikola Tesla in the 1890s.

ESJ #8 gave a very brief introduction to the idea of electrostatic longitudinal wave experiments which I performed from February to April of 1993. The experiments, which were simple and varied, coupled with those of June 1994, have established certain facts about the transmission of electrostatic potential.

The basic experiment and detection circuit is shown in Fig. 1. An aluminum antenna ball sits on a plastic rod three feet above the ground. The ball is connected directly to the oscilloscope input probe. A 5000V DC, 0.006 μF ceramic capacitor separates the ball from the ground in order to attenuate the 60 Hz power line radiations. The ball and scope are connected using a coaxial cable, the outside sheath of which is grounded.



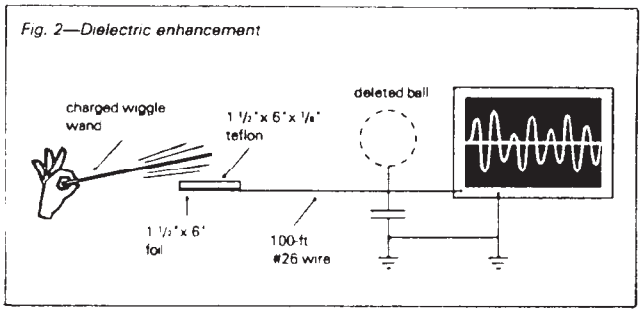
Experiment I: In the first series of experiments, it was established that a charged plastic rod could effectively transmit an electric potential waveform through the air. The rod was held more than 10 feet from the ball, and then wiggled back and forth a few inches. The plastic rod was charged by simple frictional rubbing with a cloth. The voltage pattern oscillated plus or minus a few millivolts. The rod, when wiggled a few inches from the ball, produced potential variations of ± 1/2 volt.

Experiment II: A 100-foot long, enamel insulated #26 wire was attached to the ball and laid along the ground. The same plastic rod was wiggled at the far end of the wire. The oscilloscope registered nearly ± 1/2 volt oscillations, the same amplitude that the scope would register if the rod were wiggled only a few inches away from the ball through the air. There is no noticeable attenuation and no noticeable signal interference through the wire.

Experiment III: There may be a focusing capability, as a charged rod wiggled at the center of curvature, 16 feet from a 12-inch diameter metallic mirror, seemed to produce a stronger response than if wiggled off-axis, at the same radial distance from the mirror. However, this focusing ability is still not certain.

Experiment IV: Wiggling the rod at a given distance, and increasing the antenna area (by adding a flat metal plate), increases the signal strength reception in accordance with the area increase.

Experiment V: With the ball remaining a given size, increasing the plastic rod area increases the signal strength received in accordance with the rod area. It is definite that the aerial transmission effects are not bothered by high humidity (they may even be enhanced). I have done the experiments from 50% humidity to 100% humidity. Underwater is next!



Experiment VI: If the ball antenna is replaced by a flat foil surface covered by a 1/8" layer of Teflon, (see Fig. 2) the static charge transmission signal is greatly enhanced. In fact, simply touching the Teflon surface and making slight movements, or touching the surface intermittently, transmits strong signals. We are talking two to three volts,

not simply millivolts. The gauge and length of the wire do not seem to matter.

It is apparent that by increasing the surface area of the metal plate and/or the wiggled rod, electrodynamic power might very well be transmitted through the small wire conductor. This is no different from what Tesla said: that electrical energy could be transmitted through the ground using longitudinal electrostatics -- wherein the ground is the active conductor. The opposite polar charge is on the ball antenna high above the ground. This is similar to what Eric Dollard has been saying for years (see video review, page 38) and to what the Russian patent says. All this has been indicated with the wiggle of a simple plastic rod charged by frictional rubbing.

Now, suppose we go the next step to really high potentials like those developed by the Tesla magnifier. It operates at high frequencies and is able to inherently produce electrostatic charge separation and effects. This was suggested by Tesla and shown to be possible by Richard Hull and Ron Kovac. There are reports that the device described in the Russian patent application has transmitted 100 watts of power over long distances through hair-thin wire. I would like to point out that these experiments are extremely simple and produce very strong signal transmissions (many volts) with the slightest of electrostatic charge. I encourage others to experiment with this technique.

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EDITOR'S COMMENTS

We commend Charles Yost for sharing his "electret" experiments with us. We strongly encourage you to replicate his work in reading the changes of an electrostatic field by using a moving charged device and monitoring with an oscilloscope. Perhaps some of our readers can write us and tell us where we can buy strong electrets. An electret is made by having an excellent dielectric plastic material become polymerized while curing in a strong electrostatic field. Maybe some of our friends that produce high voltage (like for use with Tesla coils) can make some electrets. The charge in an electret should last for a long time if the plastic material is an excellent insulator. We would like to receive some experimental data where you pivot and rotate an electret (with opposite charges at each end of the electret) near a pickup sphere (or plate) connected to the oscilloscope. Data on the strength of the induced voltage as a function of distance would be of interest. We would expect that the induced voltage would obey the inverse-square law. Also, what is the difference of the induced voltage provided by a rotating magnet as compared with a rotating electret. Also, there are a small percentage of persons who can see magnetic fields. Is an electret field visible to these persons? Usually a person that can see magnetic fields can see emanations from crystals, especially from the tips of crystals. If you can produce a sensitive measure for the moving electric field (rotating electret), try rotating a quartz or other type of pointed crystal to see if any emanation is measurable. The human body is a generator of fields. After you have established a sensitive measuring device for electrostatic fields try moving your hand back and forth and see if that type of motion develops a measurable longitudinal wave. Please let us know what you learn, we want to share. When you write, please send pictures and/or describe all equipment and measuring distance very precisely.

VACUUM ENERGY
(also known as "zero-point energy," "inertial frame," and "space energy")
Published by the Planetary Association for Clean Energy, Inc., of Ottowa, Ontario, Canada, May 1994)
A synopsis of knowledge from the Denver International Symposium on New Energy, May 14-16, 1994.

Empty space is not truly empty, but contains an enormous amount of untapped electromagnetic energy known as zero-point energy ("zero" referring to the fact that this energy exists even at a temperature of absolute zero where no thermal effects remain).

Vacuum energy is traced to the radiation from fluctuating quantum motion of charged particles distributed throughout the universe. These charged particles produce such well-known physical consequences as the perturbation of atomic spectral lines known as the **Lamb Shift**, the **van der Waals forces** of chemical attraction and the **Casimir Effect** related to the attractive quantum force found between closely-spaced geometries. It is also the inertial frame experienced in acceleration and deceleration. It is likely that gravity is an effect of vacuum energy.

Nobel Laureate Prof. John Archibald Wheeler determined that the zero-point energy continuum of the vacuum has an energy density ranging from 10^{19} and 10^{127} watt-seconds per cubic centimeter, while 1 cubic centimeter of pure vacuum continuum contains enough energy to condense to 10^{80} to 10^{120} grams of matter.

The very premise of **Michael Faraday's** pioneer work on electrical induction is contingent on movement through "a volume of space in which a magnetic field is present"

(and not "magnetic lines of force"). This is the basis of current electrical engineering.

An early utilization of vacuum energy power generation was a car electric engine developed by Nobel Laureate **Dr. Nikola Tesla** for his own personal use, based on his 1901 patent, "Method of utilizing radiant energy" which described a gating procedure for tapping background radiation of the ambient medium: vacuum or space itself. Another stand-alone "radiant energy" system generating 50kW was developed by **Dr. T. Henry Moray** between the 1900s and 1930s using "off the shelf" parts; it was positively reviewed by top electrical industry experts.

Today a number of systems have been presented: large to micro scale vacuum tubes, cermet (ceramic-metallic) semiconductors, magnetic material configurations, and special capacitors. In general they are easy to manipulate, and should be low-cost. Most of these systems are protected by patent applications or by letters patent.

What We Know About Vacuum Energy

Electrical Induction: When a conductor is moved through a volume of space in which a magnetic field is present, current flow is induced in the conductor. (Michael Faraday, 1831)

Magnetic Field: When a direct current flows in a coil, in a volume of space containing vacuum energy, a magnetic field appears in the center of the coil and the orientation of the magnetic polarity can be determined if the direction of the current is known. (Michael Faraday, 1831)

Magnetic materials: Some atomic and/or molecular structures in a volume of space containing vacuum energy can sustain temporarily, or exhibit permanently, strong magnetic fields, especially when such a magnetic material is placed within an electric coil in which current is flowing. (Michael Faraday)

Levitation with conduction sphere: When a conducting spherical electrode is rotated and high-voltage electricity is applied, small metal balls, cork, wood can be supported against gravity in a volume of space. (George S. Piggot, William F. Hamilton, 1904)

Gravity and high voltage: When a mass is connected to high voltage, gravitational attraction is affected. (Francis Nipher, 1916-17)

Gravity and gyroscope: When a spinning gyroscope falls along its axis of rotation, the rate of fall in the Earth's gravity field is slowed. (Bruce DePalma, 1972)

Gravity and magnets/coils: When non-inductive coils are wound around magnets and these coils are energized, the rate of fall in the Earth's gravity field is slowed. (Donald A. Kelly, 1993-94)

N-machines: When layers of magnets and conductors are rotated, electricity is produced. When an N-machine is operated in a no-load condition, input torque measured is the same as when the unit is operated at a full-load condition, distinguishing performance in variance with classical electric motors and generators. (Bruce DePalma, Paramahamsa Tewari and Shiuji Inomata, 1977-1994)

Force by high-voltage: When high-voltage is applied to an air foil, mechanical forces are produced. (T. Townsend Brown, 1951-1955, William Hooper, 1968-1974)

Energy stored in magnetic field: Under certain conditions, magnets may store energy in space which can be recaptured for use. This phenomenon may be related to such experimental devices as the Adams magnetic motor developed in New Zealand. (Harold Aspden, 1993)

Electron charge clusters: When a high-density electron charge cluster is produced, it travels at about 0.1 of the speed of light in the electric fields between cathode and anode. Under certain conditions, more energy may be extracted from the high-density charge cluster than is required to produce the charge cluster. (Kenneth R. Shoulders, 1985)

Electric generation and levitation: When magnetic forces are produced at right angles in the presence of rotary motion, high voltage electricity is generated, temperature is reduced and gravity is reduced. (John R.R. Searle, 1957-1994)

Space energy is not isotropic: When cylindrical magnets revolve about their axes, slowing time varies according to direction of rotation, indicating effect of rotation with Earth's magnetic field. (Christian Monstein, 1993-1994). A magnetically responsive test specimen located inside a superconducting electromagnetic solenoid detects forces which vary with time and rotation about the Sun, suggesting that the vacuum has an intrinsic direction property connected with magnetism - and suggests that vacuum energy devices could perform with efficiencies varying with the time of day. (Baurov, Klimenko and Novikov, 1991)

Electric and magnetic fields occur simultaneously as charges move: Time variable electric current (accelerating electron) creates an electric field parallel to that current, inducing electrical currents which last as long

as current is charging. This electric force is a dragging force causing charges to move parallel (or anti-parallel) relative to the direction of current and may be known as the electrokinetic field. (Prof. Oleg D. Jefimenko, 1979-1992). Magnets conditioned to produce a motional field permitting gating to vacuum energy once triggered (9V battery allows production of up to 50kW of useful energy, but resulting in weight loss of generating system.) (Floyd A. Sweet, 1988). These parallel and anti-parallel charges may be separated and engineered for energy production. (Tom E. Bearden and William Jay Fogal, 1993-1994)

Acceleration of electron flow results in excess energy: Acceleration of plasma electrons in physical vacuum results in excess energy. (Prof. Alexandr Chernetskil and J.A. Galkin, 1971-1989; Harold E. Puthoff and Kenneth R. Shoulders, 1991-1994). When electric current flows in an accelerated fashion in a ceramic-metallic semiconductor "cermet," the circulating current provides excess energy to a tank circuit. (Wingate A. Lambertson, 1980-1994)

PROTON INSIGHT WITH HERA

Faye Flam (science writer), "The Inner Sanctum of the Proton," *Science*, vol 264, no 5167, pp 1843-1844.

SUMMARY

The interior of atomic particles has been a mystery, and only now is beginning to be somewhat understood. A tool that is making this possible is the Hadron-Electron Ring Accelerator (HERA) at DESY, the German particle physics laboratory near Hamburg.

Scientists had already known about the proton's main constituents, the three objects known as quarks in each proton. Being so much smaller than the proton, the quarks are like grains of sand in a sea of space, with lots of room to have other activity going on. But until now scientists haven't had the tools to enable them to see what is there. The only theory to help explain it all was the "messy and poorly understood" theory of quantum chromodynamics (QCD). So it was a mystery.

HERA's international team of researchers have found a surprisingly active inner life for the proton (and, by inference, the neutron). They have recorded mysterious collisions in which electrons ricochet off an unidentified object within the proton's inner space. The three familiar quarks (known as "valence" quarks) exist in a surprisingly dense space filled with short-lived "virtual" quarks that wink in and out of existence. Yet most of the electrons traveled through the protons as if they weren't there. As far as figuring out how many "virtual" particles there are in a proton, the math is just too complicated to have been solved as yet.

So HERA surprised physicists with the bustling crowd of virtual quarks and their attendant gluons (force carrying particles which bind quarks together) that they believe to be in the proton. Because HERA accelerates both the protons and electrons and collides them head-on, it can achieve about 100 times the collision energy of the former fixed-target experiments, therefore enabling the size scale to be 100 times smaller than ever before.

From all the new evidence, and the records of the outcomes of thousands of collisions, researchers can get an impression of a "sea" of virtual quarks and gluons that is extremely active. One physicist commented on there being evidence for about 30 gluons and three or four virtual quarks at any given time. Since this could not have been predicted by current theory, the research will have a profound effect on the understanding of protons and neutrons.

There's also an unidentified object whose presence is inferred by a strange set of collision tracks. In these collisions, the electron seems to bounce off something within the proton, and a very sparse particle jet suggests that something has been knocked out of the proton. But the proton does not disintegrate. This was totally unexpected. Theorists have guessed that the cause may be a "pomeron," a particle theorized in the early 60's but set aside when quarks were identified as the proton's internal components. Nobody has really known what the pomeron might be. It is thought possible, though completely unexpected, that it might be a temporary clump of gluons. Nothing in established theory predicts it.

Particle physics is treading new areas that theory has not covered before. Continued experimentation with HERA may revolutionize some of the currently established research techniques, in addition to the old theories.

Summary by D. Torres

FASTER THAN LIGHT?

Courtesy of Samuel P. Faile

K.A. Fackelmann, "Faster-Than-Light Time Tunnels for Photons," *Science News*, Vol. 146, No. 1, July 2, 1994, page 6, 1 figure.

EDITOR'S SUMMARY

Recently, Raymond Y. Chiao, Paul G. Kwiat, and Aephraim M. Steinberg of the University of California,