What You Can Learn from a Baseball Cap, some Cardboard, and a Hat Box

"Finding the Science Behind a Strip of Elastomer with Healing Properties"

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On November 25, 2018, David Sullivan of E2 Performance Technologies, Inc., presented me with some very simple wearable items that were treated with their proprietary electromagnetic post-processing technology. This "treatment", for lack of a better term, applied to my wrist watch, for example, has restored my sense of balance which has been degrading over the past few years. I no longer have the wrist watch but am using a band of rubber treated similarly, with the same results. My wife, who had been experiencing fairly severe hip pain for several years, has experienced a significant degree of relief by wearing a treated adhesive-backed elastomeric patch worn on the skin over the painful area.[1] David was wondering if there was a scientific theory to explain this, and if I could help him find the answer.

I will not describe the process here, since this paper may be distributed beyond the boundaries of a nondisclosure agreement that I signed. This paper has been authorized for distribution by E2 Performance Technologies however. I will say for the benefit of the reader who is not aware of the technology, that the application of a proprietary combination of electromagnetic, mechanical and thermal processes on an elastomeric band results in a material that has unusual rejuvenation properties for the human body. This has been verified through independent double-blind testing with the results analyzed by a reputable statistical analysis organization. From the cause-effect viewpoint of western thinking, this suggests that the processing done on the elastomeric band by E2 Technologies does something it that to allows it to interact with the human body in a beneficial manner.

Trying to understand this from a conventional scientific frame of reference has so far, proved fruitless. To gain insight, I had to apply what knowledge I have on alternative electromagnetic theories to what I knew about the E2 process. As a science in general, we know little about the

[1] https://www.amazon.com/Kinesiology-Tape-embedded-Technology-Beige/dp/B072KM5MKS/ref=sr_1_1?crid=1F7CQ8MLQ1E2X&dchild=1&keywords=e2ktape&qid=1609534200&sprefix=E2K%2Caps%2C224&sr=8-1

application of these alternate theories, and especially how they relate to health matters and the well-being of humans. Let me digress for a moment and explain why.

Approximately 150 years ago, physicist James Clerk Maxwell introduced an electromagnetic theory that unified the concepts accredited to his predecessors, Faraday, Coulomb, and Ampere. The mathematics utilized in his theory made it cumbersome to the point of challenging its usability. Over the next fifty years or so, big names in the science at the time, such as Heaviside and Lorenz, introduced simplifying concepts that not only significantly reduced the complexity of the mathematics involved, but simultaneously verified that the available experimental data fit one comprehensive electromagnetic theory. This limitation, which works very well, perhaps to the detriment of scientific advancement, has prevailed to present times. It has limited not only technological development, but also the development of measurement tools to refute the limiting assumptions – a self-defeating scenario.

Unfortunately, these simplifications also eliminated the possibility of the existence of longitudinal waves [1] in western thinking. It was proven quite conclusively within the confines of this reduced theory, that the electric and magnetic field components of the electromagnetic wave had to be transverse[2] in character, that is, the oscillations of these components had to be perpendicular to the direction of wave travel.

Nicola Tesla, by the turn of the last century, had shown the world that the DC technology invented and advocated by Thomas Edison was not suitable for the commercial distribution of electrical energy. He advocated the commercialization of his invention of alternating current electricity which became a most successful venture for some. Shortly thereafter, Tesla realized the limiting nature of his own thinking went on to develop longitudinal wave technology, termed a "new radiation", that promised "almost free" distribution of electrical energy across the globe. This was not readily accepted by his financial backers, perhaps due to their inability to gain financially from it, and sadly, he was relegated to a footnote in the history books, seldom mentioned and never taught in scientific mainstream, a mistake that has also persisted to the present time.

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[2] A transverse wave can be visualized as the normal wave on a stretched rope – the oscillations are perpendicular to the direction of travel of the wave. A longitudinal wave is typified by a sound wave, that is, a wave of compression where the compressive motion of the wave is in the direction of wave travel. Sometimes the term "scalar" is applied to the longitudinal component.

Associated with the longitudinal wave technology was a previously unexplored form of radiation that Tesla noted offered benefits to a person's "well-being". He developed and patented apparatus for utilizing this "radiant energy" for the treatment of human ailments, something he often shared with his friend, Mark Twain.

Tesla broke electromagnetism into three distinct types,

- conventional direct and alternating current
- high frequency alternating current
- compressive electromagnetics or radiant energy.

The third item has generated over the past century and even today, much fantasy and fanaticism in the non-specialist literature, and limited response in the more "respected" literature. It is not taught in schools, and it is not explained by conventional theory.

In a series of patents [2 - 12] and articles [13 - 14] Nicola Tesla outlined his radiant energy technology, describing this phenomenon as

- occurring only when sharp temporal gradients in potential are experienced
- requiring all potential pulses to be unidirectional
- propagating as a compressive or pressure wave
- not decreasing in strength with distance as other fields do
- not restricted to the speed of light
- waves that radiate perpendicular to a conductor
- exhibiting unusual resistive properties in that if a restriction in a conductor for example is encountered, the potential increases in such a manner that the flow of charge is maintained.
- varying in behavior with changes in material type that are not as significant as with conventional electromagnetism, however aluminum is noted as a poor conductor.

"Cold current" is another term that is used to describe similar electromagnetic phenomena that is not describable by conventional electromagnetic theory. Some authors [19] suggest that Tesla's radiant energy and cold current are the same. Also included in this list are terms such as subtle energy, orgone energy, scalar wave energy and longitudinal wave energy. Although these effects

have been observed for more than a century, a comprehensive explanation has eluded conventional science.

From a mathematical standpoint, conventional electromagnetism and quantum theory are based on a "frame of reference" or spacetime geometry that is flat (a Cartesian or Minkowski spacetime) whereas gravitation is based on the curved Riemann geometry of Einstein's General Relativity. Neither give rise to a physics that explains the above observations. To achieve this, the concept of twisting of spacetime, or torsion must be added to the mathematics.

Torsion has not been given much attention by western science as David Yurth writes [28], "Because the torsion field is usually very small, it is assumed to be zero in western science…the constant of spin-torsion interactions is approximately 27 orders of magnitude weaker than the constant of gravitational interactions. Accordingly, many authors have erroneously asserted, based on this result, that experimentally observed phenomena cannot be explained by torsion theories because torsion effects are much too weak to be observed." I might add that the mathematical sophistication required for an adequate introduction of the torsion field is far from simple and in the author's opinion, this too has hindered the development of a full torsion theory.

In the Eastern European countries, scalar electromagnetics and more recently torsional field theory, has received more scientific attention in the twentieth century than given by the west [27]. It wasn't until 2003, Myron Evans expanding on prior work that he did with Viger developing the $B(3)$ [3] magnetic field theory, discovered a unified field theory that coupled an expanded electromagnetic theory, quantum mechanics, and general relativity into one. It has since become known as the "Einstein, Cartan, Evans" Generally Covariant Unified Field Theory, or ECE for short. It has been my honor to work with Myron until his untimely passing in May, 2019, and it remains an honor for me to work with the acting co-president of the AIAS, Horst Eckardt, with whom I have co-authored many publications over the past thirteen years.

ECE theory is based on a differential geometry originally outlined by Cartan [26] in the 1920's, which permits spacetime to both bend and twist, through the introduction of a torsion field. This

[3] The complete development of the theory is available on the website www.AIAS.us

permits the unification of electromagnetics, gravitation, and quantum mechanics, and demonstrates interconnections and non-linearities that do not appear in the mathematics of conventional physics of today. It also allows the existence of a "physical vacuum" as an energetic field that dynamically rich, and universally available.

David Yurth writes [23], "Unlike electromagnetic waves, torsion waves transmit information without transmitting energy. They propagate through physical media without interacting in the traditional sense with the media…But propagating torsion fields have been shown by many experimenters to alter the spin state of physical media. When considered in terms of time-polarization of the transverse EM wave functions, torsion fields have been shown to operate at infinite distances without measurable time differentials or significant field attenuation."

In a series of three papers [15-17], Lindstrom and Eckardt showed that the ECE electromagnetic field collapsed to the traditional Maxwell field if the first two points on the above list of requirements by Tesla are violated. It has been shown in special situations that the electrostatic field of ECE does not decrease with distance [18] in the standard manner but rather is supported by an energetic vacuum state, upon which the static field resides. This suggests that theoretical explanations for the anomalous electromagnetic behavior reported by Tesla and others that exist outside the realm of traditional or classical theories may have an explanation using the ECE theory.

Bioelectricity

The association of electrical events with human perceptions, nervous health, the occult, etc. goes back in a documented fashion, to at least the early 1800's with the medical studies of Baron Karl von Reichenbach, where "influences" on the "mental stability" of certain individuals could be correlated with the phases of the moon, particularly pronounced when the moon was "full" [20]. He termed the energy which came from the moon "Od". The properties of this energy closely aligned with those described by Tesla, nearly a century later. Reichenbach's research was rediscovered much later by Dr. George S. White and Dr. Albert Abrams, who later founded the "science of radionics" loosely based on this earlier work.

The bioelectric field about the human body has been studied [21] on this continent primarily utilizing the traditional Maxwellian electrodynamic model for explanations, whereas in the eastern European countries, such concepts as longitudinal waves are incorporated into the explanations. People such as Konstantin Meyl have been at the forefront of this in Europe for several decades. In the introduction to his book [22], Dr. Meyl illustrates the relevant regions of the electromagnetic spectrum, from which the following figure is extracted.

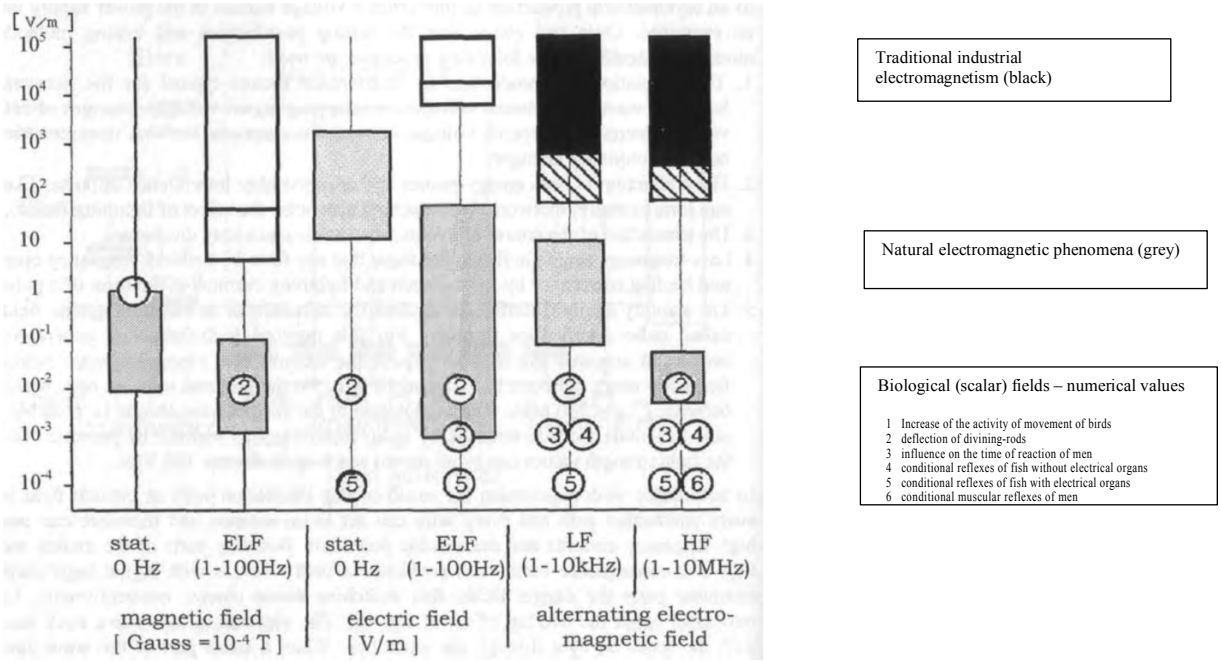

Figure 1. The Biological Electromagnetic Field

We can see from Figure 1, that to measure biological electromagnetic effects, we need to be able to measure electric fields as small as 10^{-4} volts per meter, and magnetic fields as small as 10^{-4} Gauss with a frequency range of DC through 10 MHz. Standard electrical technology focusses on electrical fields that start at about 100 volts per meter and upwards, a million times larger than the bioelectric fields.

Measurements of the magnetic field about a human body [21] using a SQUID detection apparatus gives results shown in Figure 2. It is interesting to note that the magnetic fields that dowsing detects is estimated at about 10^{-6} Tesla, about a million times larger than the magnetic fields

emanating from human brain [21]. Magnetic field used in industry are typically a trillion times larger than this.

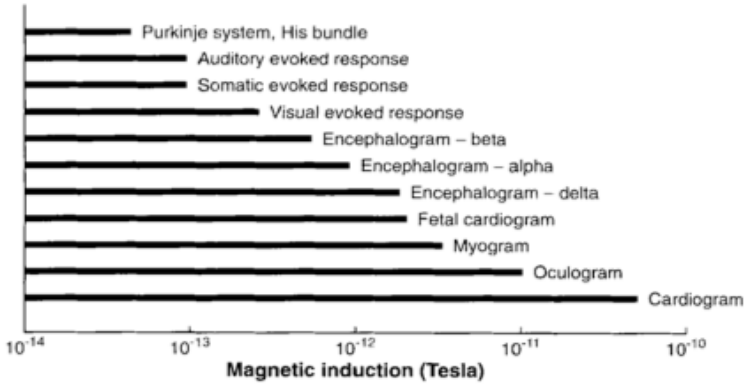

Figure 2. Magnetic Field About Human Body by Squid Method. [21]

With the great differences between the field strengths of traditional electrical technology and electromagnetic field strength for living material, one cannot help but wonder how the two can be connected without posing great danger to the biological entity. Well, put simply, they can't. The high field strength of traditional electrical technology will kill biological entities. It is suspected, although you won't get significant agreement on this from western authorities, that the electromagnetic radiation from even the much lower electromagnetic fields found beneath overhead power transmission lines, from your cell phone press against your head, and even from an electric heating blanket which you might enjoy on a cold winter night, may do harm.

I will not comment on whether the above thinking is correct or not. However, it is always best to err on the safe side, and given the limited thinking on the part of the physics community in accepting alternate or expanded models of electrodynamics as an example, it is prudent to examine eastern thinking in regards the link between bodily well-being and electrodynamic effects.

The link between bodily healing and devices such as the E2-K tape requires the explanation of two concepts not readily accepted by western medicine nor western physics. The first is how something of value from a healing standpoint can be stored in an item such as a piece of elastomeric tape, and the second is how this is transmitted to the human body.

In physics terminology, when one signal can influence or "lock in" on another signal, the term used is "entrainment" or "phase locking" where the forcing signal can be acoustic[4], vibrational, or electrical. There is much evidence to suggest bio-entrainment to the so-called Schumann geomagnetic signal[5] is common. Although questioned by western medicine, there is evidence [21] that

- admittance to psychiatric facilities is influenced by geomagnetic activity
- frequency of epileptic seizures correlates with changes in the geomagnetic field,
- suicide rates are higher for people living under high voltage transmission lines, etc.

Oschmann discusses the concept of entrainment and its implications with human physiology at length in his book [25] from which the following is taken, "Many studies have demonstrated the probable entrainment of brainwaves by external rhythms of natural or artificial origin…The pineal gland is the primary magnetoreceptor…Two separate research groups have now recorded magnetically influenced impulses in single neurons connecting magnetite-bearing tissues with the brain…There are now a number of plausible and well-documented mechanisms for such Yurth hints at this in his discussion on bio-communication [28]

"An analogous effect was discovered in the 60's by the V.P. Kaznacheev group. Their research was related to the theoretical and experimental investigations conducted in the 20's by a A.G. Gurvich. In the 20's, Gurvich experimentally discovered the super-weak radiation emitted by cells which has been called "mitogenic radiation…in other experiments conducted by several other equally proficient research groups, it was established that …the intercellular interactions were the result of interaction between the torsion fields of the test cells. In particular, this conclusion was confirmed during experiments conducted by the L.N. Lupichev group in the late 80's. In the Lupichev experiments, the distant influence of various chemical substances on the cells was investigated. It was established that it is possible to create conditions where the influence can be detected even if the chemical substance is shielded by metal screens. Thus, the main factor in the observed effect had a non-[traditional] electromagnetic nature."

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[4] I recall an incident that occurred a few decades back where I was staying alone in an isolated one room cabin. Because there was no commercial electricity available, the refrigerator was powered by propane. The cooling process caused the refrigerator to ping in an almost imperceptible manner which I couldn't hear in the daytime, but at night, when I was ready for sleep, was just detectable. The ping occurred at a rate of 60 pings per minute. After a few days I noticed that my heart beat in sync with the ping, when in the meditative pre-sleep state.

[5] Schumann, in 1952 postulated that as a result of lightning strikes, energy is pumped into the ionosphere which has a natural resonant frequency of about 8 Hz, depending on local atmospheric conditions. This creates a resonant geomagnetic field. This was experimentally confirmed in the 1960's.

Another concept that is receiving much attention in Europe and Asia is that imprinting, where molecular information is imprinted on water molecules typically, which is then transferred to a life form for its utilization; I quote form a fairly recent paper [24],

"We followed the hypothesis that biologically relevant information from various substances can be non-chemically transferred to organisms through the combination of a high voltage electric field that can stably imprint information into water or a water solution. A special device was constructed and a thoroughly tested biological sensor system (cress seedlings exposed to heat stress) was used. Results showed biological effects of electrically imprinted information of biologically active substances into water solutions, however not necessarily with an obvious connection to the effects of the original (donor) substance."

In other words, what scalar electromagnetism can do that the transverse electromagnetism can't is to induce a spin on the individual nuclear particles, such as protons in the nucleus of atoms for example. This spin can be achieved globally over a material and can last for hours to years. This is essentially a material "memory" of past scalar wave history - a very large memory, when you consider the number of nuclear particles present in a small mass of material. Electrons can be spun in a similar manner, but being tiny and isolated, loose this information on a time scale of seconds or less. The process of creating of material memory is a process called "imprinting", and in essence is what E2 does to its products such as E2-K tape. Imprinting is not recognized by traditional western science but has been accepted by the eastern European scientific community for some time now. Yurth [28] has reviewed much of the Russian literature on this topic also, from which the following is taken.

"Any nuclear spin-polarized target is the source of a torsion field. This fact has been repeatedly observed and verified by numerous research groups. Since analogous spins attract and opposite spins repel, the interaction of a spin-polarized particle with a spin-polarized target nucleus results in the appearance of "anomalous" forces which depend on mutual spin orientation of the particle and the target, as demonstrated by the experiments of A.D. Krisch. Since all substances [except perhaps some amorphous materials] have their own unique stereochemistry, which determines not only the location of atoms in molecules but also determines their mutual spin orientation, the superposition of the torsion fields generated by the atomic and nuclear spins of each molecule determines the intensity of the torsion field in the space surrounding each molecule. The

superposition of all these torsion fields determines the intensity and spatial configuration of the characteristic torsion field for that substance. Thus, each substance possesses its own uniquely configured torsion field and, by definition, each physical object in living or non-living nature also can be described and recognized in terms of its unique torsion field signature…
The property which is open to influence by torsion fields is defined as the spin. Thus, the structure of the torsion field of every physical object can be altered by the influence of an external torsion field. As a result of such an influence, the configuration of the torsion field will be fixed as a meta-stable state [as a transverse spin polarization state] and will remain intact even after the dynamic source of the external torsion field is moved to another region of space. Thus, torsion fields of certain spatial configurations can be "recorded" on any physical object. This fact has been repeatedly observed and experimentally verified by a number of credible researchers."

In North America, Claude Swanson has written much on the subject. The following is taken from his recent review [29]: "In most normal materials the spins of its electrons and nuclei are distributed randomly. They point in many directions with no organization or order. Except for magnetic materials, where the spins are aligned by their mutual interaction, the spins of most materials have no pattern to them. Torsion radiation is unique in that it can apply a pattern to their spins. It can impose a new "structure" to a substance, where there was none before…Spin information imprinted in the nucleus of atoms can last for years, potentially. The nucleus of an atom is much heavier than the electron, so it has more spin inertia. It takes more energy to change its spin. The nucleus sits in the center of the atom, far away from the effects of neighboring nuclei. It has a cushion provided by its electron cloud. Consequently, once the spin of the nucleus has been set in a certain way it will retain this direction for a long time, unless acted upon by torsion radiation."

It doesn't take a large stretch of the imagination to suggest that E2 Technologies has devised an electromagnetic-mechanical-thermal signature that can be imprinted on the molecular structure of an elastomeric tape, a signature that entrains the human body forcing a healthier state of being. It then becomes the quest to illuminate the mechanisms that are involved in this process in the hope that with a deeper understanding of what is happening, even better solutions can be devised.

To conclude, I have proposed that for E2 technology, an electric field that includes a significant torsion component is established across the material to be treated by judicious choice of apparatus and environment. The torsional field modifies the spin structure of the material's nuclei essentially imprinting a unique spin signature into the processed material. This signature is selected to permit the alignment of the field implanted in the material by E2's process with that of the energetic field about a living material through a process called entrainment.

If the material signature is correctly specified and generated for a human subject, the bio-electric field of the subject will align itself in a beneficial manner with the material and will benefit positively from the process.

Measurement of Torsion Fields

With the existence of torsion fields not being readily accepted by western science, it should come as no surprise that there is little by way of instrumentation available to measure such field in the west. There appears to be equipment of a commercial nature available to measure torsion with a response time of a few seconds or less and physical accuracy of a few millimeters in any direction.

Kernbach, in a review of metrology of systems producing "high penetrating" emissions [30], classed the available detectors according to detection mechanism. These are listed in the following table and rated in terms of applicability to the problem at hand. Because the measured signals are very small, often on par or smaller than electronic equipment noise, he suggested that a differential measurement (comparison of modified signal to that of a control) technique would be most applicable. In addition, shielding from vibration, temperature change, background EM, etc. was required.

Several conclusions can be drawn from this equipment review;

- No universally accepted measuring system available, ELF system of Lipkova and Checak shows promise if antenna can be reduced significantly in volume.
- Most available equipment measures a large area be it space or time.
- "Seva plus" redesigned antenna may work- antenna with small foot print not available.

- Differential measurement system most suited since it potentially can eliminate many experimental variables that are difficult to control. This may include a differential spectrum analyzer that is suitable for the ELF band of the spectrum.

Table 1. Detection and Measurement for Longitudinal Electromagnetic Radiation

Detection Method	Description	Device Examples	Comments	Foot Print
Operator Based Methods[6]	Dowsing, auric field methods		Unaccepted science	Small
Macrobiological Methods	plant tissue conductivity. germination times, growth rates		Long term testing	Large-time
Microbiological Methods	CO2 from yeasts, sedimentation rates		Medium term testing	Large-time
Chemical Reaction Parameters	reaction rates, absorption, pH	Differential Impedance Spectrometer-Cybertronica	Long test duration	Large-time
Phase transitions	change in metal grain structure, water dipole structures, polymer morphology	SWM Technologies[7]	Large power levels required-suitable for processing	
Radioactive sources	change in decay rate			
Material Property Changes	dielectric, magnetic, conductivity, density		Qualifies if sensitive instrumentation exists	
Electric Field Changes	potential measurements	IGA-1[8]	Qualifies if sensitive instrumentation exists	Large-space
Torsion Systems	changes in spacetime	Simonov detector, Kozyrev torsion balance	Qualifies if sensitive instrumentation exists	Large-space
Properties of Noise	tunnel diode noise	SQUID	Traditional magnetic field	
Non-local properties/after effect	long distance entanglement	IGA-1	Qualifies if sensitive instrumentation exists	Large-space
RF Phase Shift	field phase change	Vega, Seva[9]		Medium-space
Photographic Methods		Kirilian photography, GDV[10], EPC		Large-space
Spin Polarization	direct detection	NMR		
Frequency change	change in reflected light	Bioscope[11]		Small-space
ELF Antenna[12]	Low frequency EMF antenna and low noise receiver			Large-space

[6] Operator based techniques such as dowsing may be suitable for detection purposes, but do not have a rigorously definable scale for measurements or reproducible measurement variable, across various operators. Yes/no responses are more consistent.

[7] Korapov and Panov have developed a process that changes the grain structure of metals during solidification from a melt state. Mechanical property improvements in excess of 50% are noted. IAC'09 International Aerospace Conference, Moscow, August 23-27, 2009

[8] Developed to measure magnetic component of Earth's geomagnetic field, but useful for measurement of extremely small electromagnetic fields. Picovolt sensitivity. Commercially available in Russia. http://www.iga1.ru/iga.html

[9] The Seva (Spinning Electric Vector Analyzer) was developed by Mark Krinker at CityTech, part of CUNY in New York. Commercial availability unknown.

[10] The Biowell 2 camera is the latest modification of the GDV technique developed by Kortkov and sells for $1899, from Bio-Well LLC in Louisville, CO.

[11] Rated as reliable and reproducible senor by independent laboratories. Not commercially available.

[12] J. Lipkova, J. Cechak, "Existence of Electromagnetic Radiation in Humans in ELF Band", Progress in Electromagnetics Research Symposium, August 22-26, 2005, Hangzhou, China

Table 2. Potentially Useful Devices for Sensing Longitudinal Electromagnetic Radiation

Device	Method of Operation	Sensitivity	Source	Cost/Availability
IGA-1	Phase shift of signal at selected frequency	10^{-12} volts @kHz frequencies	Russia	Unknown
SEVA-Integral with redsigned ELF Antenna	Phase shift of field at selected frequency	ELF through 250 MHz,	Mark Krinker , CUNY, New York	Unknown
Bioscope	Changes in reflected light off living materials	Unknown, but can distinguish between life forms	Russia	Unknown
Biowell-2	Off shoot of Kirilian photography	Qualitative- used on Russian Olympic athletes	Bio-Well LLC Louisville, CO.	$1899
Lipkova-Checak device	ELF low noise radio	Sensitive to operator position change	Not commercial	Unknown

From the above table, the following devices claim to have the capability of measuring torsion fields, however none are capable of torsion measurements with the time and spatial resolution suggested above. It is seen in Table 1 that dowsing is listed as a possible detection means for torsion.

Dowsers are reported to detect fields typically as small as 10^{-2} Volts per meter for an electric field; personally, I suspect this can be much smaller. Dowsing is the ancient art of detecting the geomagnetic signature of water in an arid landscape for example, or for the "out of sorts" reasons for a person with an illness that drags on, etc. My father was a dowser of water, and found many good wells (with 100% certainly as I recall) in an otherwise arid landscape. I seem to have inherited that ability. When my daughter was an infant, she suffered from many allergies and really didn't have the strength to conquer them on her own. I was very fortunate to make the acquaintance of a dowser who taught me how to use a pendulum to identify what foods were causing my daughter's allergic reactions; these often changed on a daily basis.

The applications for dowsing are much broader than this, extending for example, to mapping the space-time distortions caused by the so-called "sacred geometries". This topic is beyond the scope of this discussion, but it suffices to say that the following discussion of experiments performed by the author are not out of character with this dowsing application.

The science of dowsing is much more developed and accepted in Europe, especially Britain, than it is in North America. The consensus in Europe is that dowsing is a reliable measuring process but is subject to scaling errors, largely outside the dowser's control. This means that a yes / no

response to a "field disturbance" is reliably measured, whereas the magnitude of response to a field disturbance is variable over a broader time scale (days or weeks) and loses its meaning in an absolute sense. It is thought however that if a minimum and maximum values can be set by the dowser, then a given measurement relative to this (e.g. 80% of full scale) is "usually" reliable. One researcher claimed to produce seven or eight reliable sequential measurements (over an hour or less) but then operator fatigue would generate invalid results should more measurements be taken.

Dowsing the Fields

During the process of acquiring test equipment information for this study, it occurred to me that since it would likely be some time before suitable instrumentation becomes available that would allow the quantification of the field around an E2 treated material in a small enough region of space to be of much value, why not try to determine some general properties of these treated materials using a dowsing method. For this updated paper, the experiments described were repeated using the same apparatus as in the prior version, but with a different pendulum for dowsing. The results where the same as those initially reported earlier (January 18, 2019).

Amongst other materials given me by E2, I had a baseball cap[13] that had undergone post-processing by the E2 process. I placed this cap in an inverted position on a table top and proceeded to check the free space for disturbances in the immediate vicinity of the cap, using a small hematite pendulum for dowsing, as shown in Figure 3. I set my mental construct (what I wanted the dowsing pendulum to respond to) as a disturbance in the surrounding space, be it electrical or otherwise. Pendulums respond uniquely to individual dowsers. My response was that for some regions around the hat, the pendulum rotated clockwise, for others, the rotation was counterclockwise, and in some regions the pendulum oscillated "to-and-fro" without rotation. I arbitrarily assigned a positive value to the clockwise rotation, and a negative to the counterclockwise rotation, and a zero value to the "to-and-fro" oscillation. I did not assign a magnitude to the result, only a sign[14], i.e. positive, negative, or zero.

[13] www.E2Performance.com

[14] All conclusions drawn from dowsing are speculative at this point. The validity of dowsing itself in this application is speculation on my part, and will remain so until we have devised a suitable corroborative measurement system that is free of operator influences.

What I found out from the cap in this position was the following, (Figure 3)

- Just outside of the edge of the bowl of the cap, the rotation of the pendulum was clockwise; just inside the bowl, the rotation was counterclockwise. This extended without change, circumferentially around the perimeter of the cap, and above the bowl in a cylinder defined by projecting the edge of the cap in an upwards direction. There was an almost instantaneous change from a positive to negative in pendulum rotation when crossing the cap material at the bowl perimeter. This transition occurred along the cylinder wall described above. The transition thickness was not measurable.
- It was also noted that the pendulum oscillated to-and-fro, everywhere else around the dome of the cap, except at a position of half the dome radius or so above the base of the dome (inside the bowl of the cap). At this point, the pendulum rotated clockwise.
- If I dowsed the field near the brim of the cap, I found that a disturbance extended far in front of the brim in all directions in the projection that the brim traces in space. Where the brim meets the bowl of the cap however, the result was zero (i.e. the disturbance does not pass through the dome).
- When I turned the cap over, I noted no disturbance anywhere above the cap except perhaps at the outside edge of the brim (erratic results).

As a control sample, I used a cap not supplied by E2. This cap did not display any disturbances that I could measure.

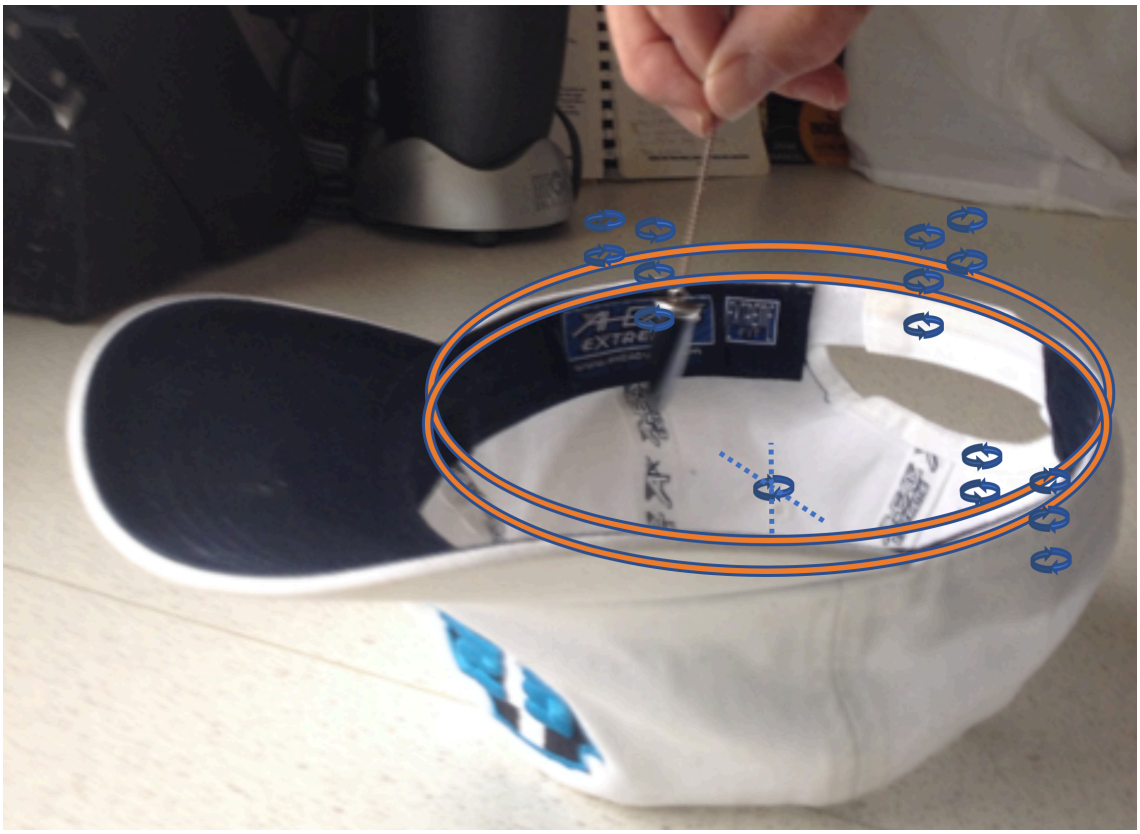

Figure 3 Dowsing of disturbances near a baseball cap. Outside the bowl of the cap and along the outside of the cylinder defined by projecting the perimeter of the cap upwards, the pendulum rotated in a clockwise manner. Inside the bowl and inside the cylinder formed by the cap perimeter, the pendulum rotated counterclockwise. The pendulum rotated clockwise at the bowl centerline, halfway up from the base of the bowl.

I was able to formulate a few testable ideas based on this simple demonstration;

- a "disturbance in the field" is generated when E2 applies their process to a material item.
- disturbances (whatever they are) originate at the edges of the geometry only, and these project beyond the physical surface as am extension of the surface into free space. There are no detectable disturbances away from the edges and the edge extensions into the surrounding space nor are there any near the surface away from the edges. That is, the disturbances occur only on edges of a treated object and along the geometric projections of these edges into free space.
- disturbances are detected without difficulty, at significant distances from the source with the same rotation of the pendulum as mentioned above being maintained.

- the narrow band of disturbance doesn't disperse with distance. That is, a widening of the disturbance (or shrinking) was not detected along the cylinder defined by the disturbance, irrespective of distance from the cap. Distances of up to 2 m. were measured, after which without further apparatus, it was difficult to say where a disturbance started and ended.
- if intersecting another piece of treated material, the disturbance band does not penetrate through it, but seems to merge with it.

To test these conclusions, I performed similar experiments on test pieces of uniform flat geometry, made by mounting a band of E2-K tape on a supporting box-shaped structure made of thin cardboard, as shown in Figure 4. For this geometry, the spin was counterclockwise over the box, and clockwise in front of the black elastic layer at all the edges. This pattern extended for at least a meter (limit of accurate measurement) or more in the plane of the elastic layer. Should the plane be severed as shown in Figure 4, the disturbance crossed the barrier without noticeable change as if the material were not separated.

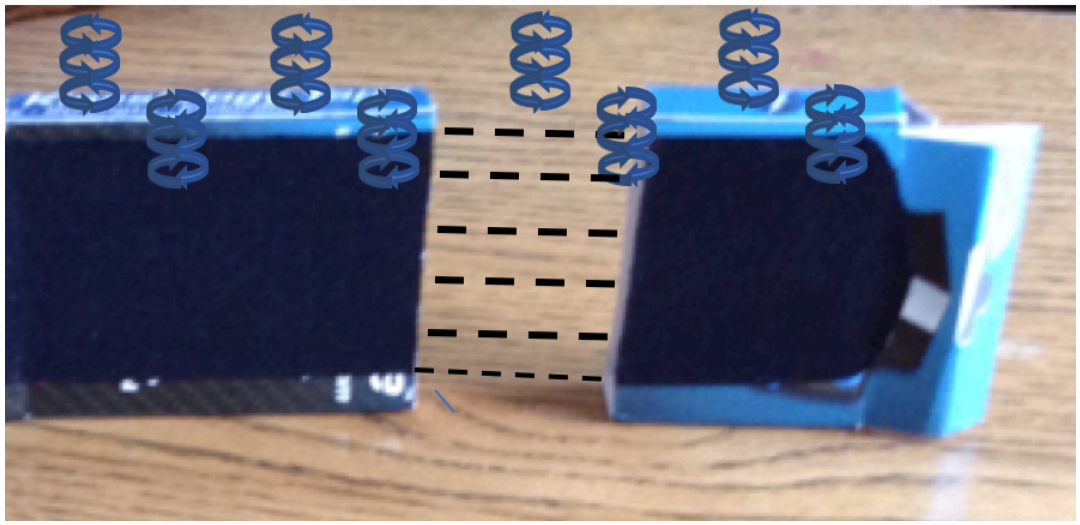

Figure 4. Dowsing of disturbances near planar structures. The pendulum rotated in clockwise manner on the adhesive-free side of the tape and counterclockwise on the side mounted to the cardboard substrate. The disturbance crossed the gap formed between two aligned planar geometries.

At corners where the E2 layers were continuous (see Figure 5), the field is much the same as if it were totally planar as in Figure 4. The same is true for the Tee junction with continuous E2 layers.

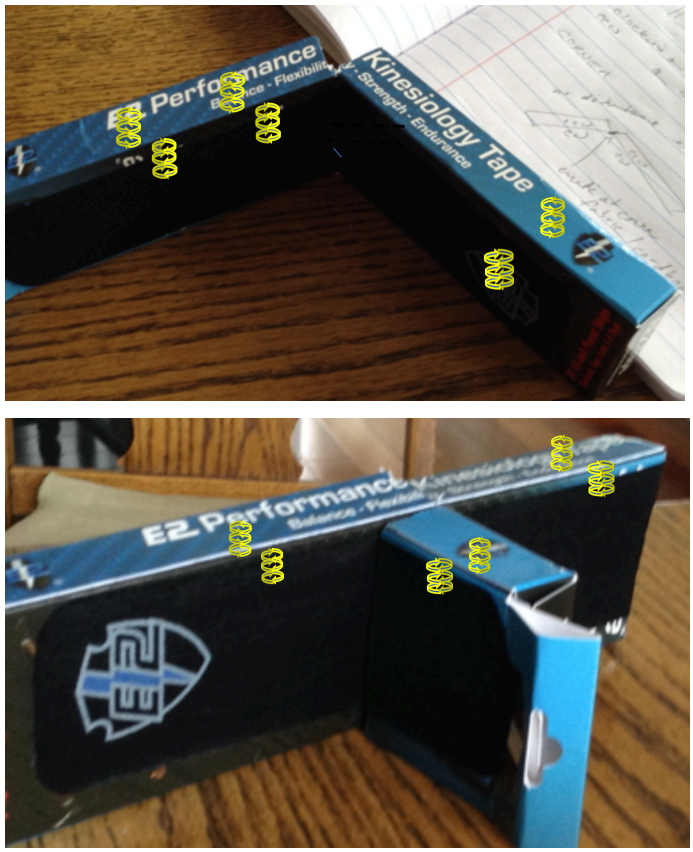

Figure 5. Dowsing disturbances at bends and Tee junctions in planar structure

In a separated Tee junction which is illustrated in Figure 6, the field propagates across the gap. The field at right angles could not be detected on the opposite side of the planar gap. It was either blocked or was merged with the planar field.

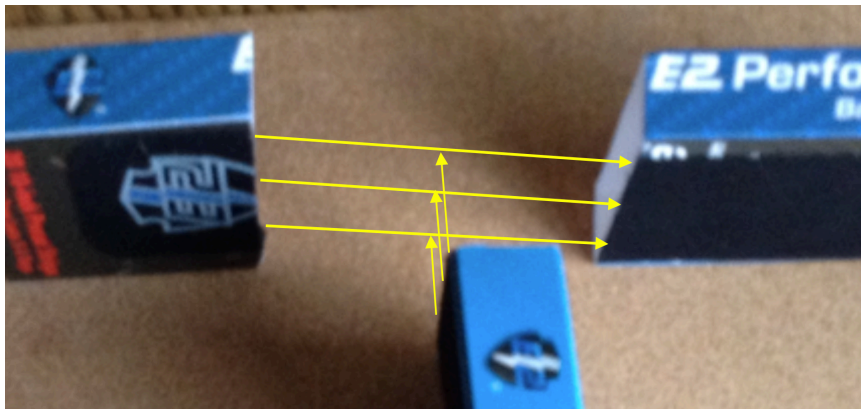

Figure 6. Dowsing disturbances for gapped Tee structure.

From the tests performed on the E2 adhesive patch attached to a cardboard box, I concluded that

- the disturbances were an edge related phenomenon.
- The disturbances were long-lived in that the fields about the materials were essentially the same after two years of storage.
- the disturbances extended outside the plane of the treated sheet as if the sheet continued. The band of disturbance did not seem to widen. I could not reliably determine if the "strength" of the disturbance varied.
- the disturbance passes around sharp bends if the tape layer was continuous.
- Disturbances do not pass through an intersecting field layer created in open air gap between two planar "sources".

As a final geometry I examined for this paper was a cylinder made of pressed paper (hat box) approximately 18.5 cm in diameter, and 5.0 cm high, layered with E2-K tape, first on the outside of the cylinder then on the bottom as shown in Figures 7 and 8.

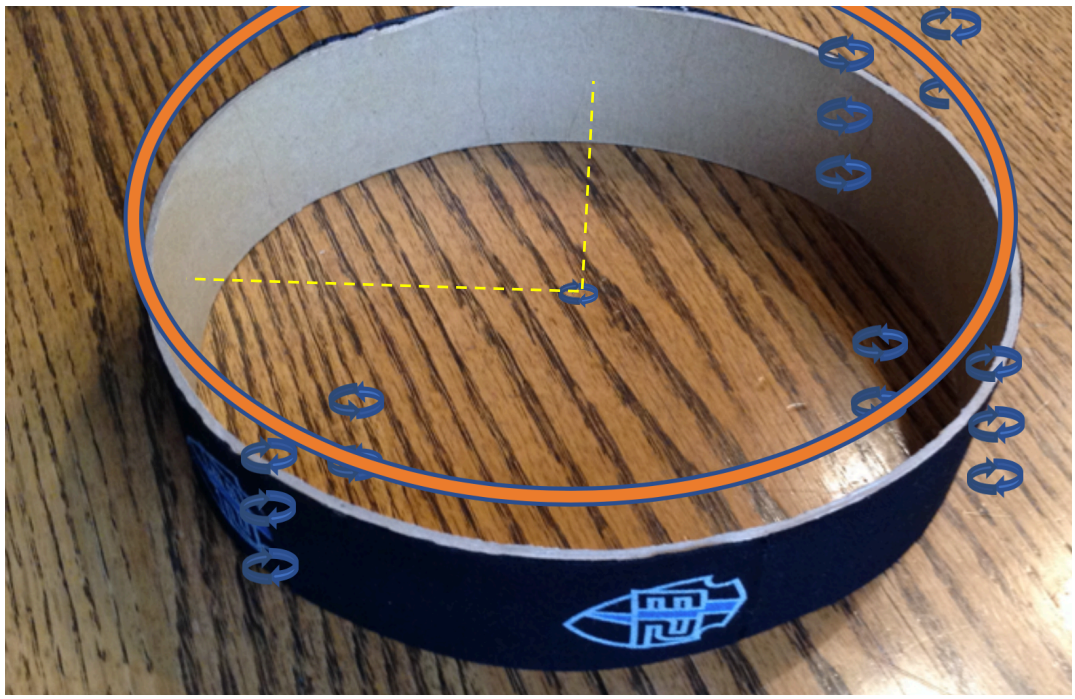

Figure 7. Dowsing disturbances near an open-ended cylinder. A small region of clockwise rotation occurred at the geometric mid-point of the cylinder.

The pendulum near the outside upper edge of the cylinder had a clockwise rotation which projected above the structure matching the diameter of the base cylinder and not changing appreciably with distance from the structure. Near the inside of the cylindrical wall, the pendulum had a counterclockwise rotation. This matches the behavior of the baseball had in the region above the dome of the hat. There was also a clockwise rotation of the pendulum at the center point of the cylinder. (Figure 7)

When the base was added (Figure 8), the clockwise rotation at the center point of the cylinder axis, extended upwards. No field was indicated below the base of the cylinder. There is also a counterclockwise rotation at the mid-point of the cylinder. A counterclockwise rotation was also found halfway up the cylinder at approximately midway radially around the cylinder, as shown in Figure 8. An illustration of what was observed is shown in Figure 9 as a cross-section.

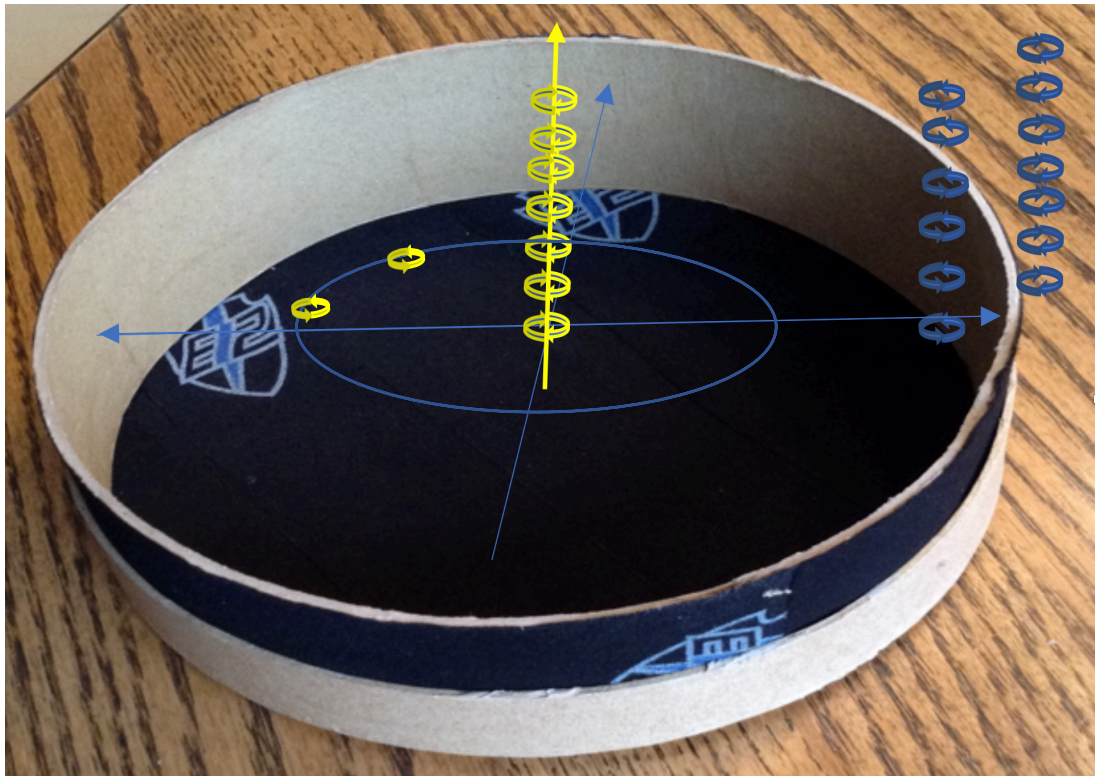

Figure 8. Dowsing disturbances near a cylinder with attached base

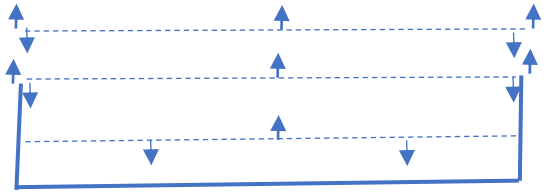

Figure 9. Illustration of disturbances near a cylinder with attached base. Upward arrows indicate clockwise pendulum spin, downwards arrows indicate counterclockwise rotation.

Discussion

If I dare ascribe some validity to the insights that dowsing has provided, then I can speculate that the E2-K Tape is a source for disturbances that are detectable by a human observer using a dowsing tool as a method of expression. It is likely that no distortion field of significant exists around the tape prior to processing by E2. I do not know for certain that the distortion measured by dowsing is torsion based.

Several characteristics of the disturbance can be inferred from the demonstrations:

- The disturbance emanates from the edges of the treated strips and is not present near the surface of the strip away from the edges.
- The disturbance propagates into the space following the defined geometry of the strip without diverging. It is unknown if the strength of the disturbance is maintained as distance increases away from the strip.
- The disturbance propagates through various materials without much hinderance until it intersects another test strip or the field generated by another test strip, at which time that plane of propagation ceases and one might guess that the fields of the two strips merge.
- The polarity of pendulum rotation on the non-adhesive side of the strip is opposite that found on the adhesive side.
- If a strip is closed upon itself in one dimension, for example a plane bent into the form of a cylinder, then the edge flux for the joined edges manifests as a disturbance along projection of the cylinder wall. Immediately adjacent to this is a rotational disturbance of opposite sign creating a cylinder of shear extending from the cylinder. A point of rotation of the same sign as the outside of the cylinder occurs at the mid-cylinder position (cylinder

rotational center at mid-height). The cylindrical field propagates in both directions from the cylinder ends.s

- If the cylinder has a bottom that is continuous with its walls, all coated with the E2-K tape, then a cylindrical disturbance appears along the center-line with the same sign as the one that is observed at the outside of the cylinder wall. A disturbance with opposite dowsing rotation is evident along the cylinder midplane.
- If the geometry is hemi-spherical, as in the baseball hat, the disturbance propagates away from the dome in a cylindrical manner. The edge flux that results from geometrically folding the plane into a hemi-sphere results in a spike in potential at a point in the dome, approximately half a radius distant from the base of the dome. This does not propagate away from the hemi-sphere as the disturbance did with the cylinder.

Is There an Explanation?

At this point, it seems that there is a distortion in a field about a material that has been treated by the E2 process. One is tempted to say that the distortion is torsion based and is electrostatic in nature, perhaps caused by a residual surface charge imparted during processing. However, there appears to be no dust gathering on the treated materials that have been sitting unprotected for a lengthy period of time, indicating that there is no surface charge. This could be verified by using a sensitive electrometer. From my knowledge of the process however, it is very unlikely that triboelectric effects (friction generated electric charge separation) nor field induced polarization, such as used to make "electrets" where molten dielectrics solidify in the presence of a static electric field are present. These are two common electrostatic charge separation mechanisms occur in the processing industries.

The illustration of data given in Figure 9 is suggestive of a Beltrami field, a shearing field that is supported by ECE theory [23]. A Beltrami field occurs when counter rotating flows are shearing past each other. Standard theory breaks down because the shear presents a mathematical singularity (a number gets divided by zero). For a cylindrical geometry, this field is composed of counter-rotating cylindrical flows that set up a rotational shear field. At this point it is difficult to say that a rotation on a large scale exists in this situation. A further refinement is offered if one

looks at the above discussions in sense of information stored in the “vacuum”, as suggested earlier [18]. The application of this and the Beltrami solution are discussions for another paper.

Very recent testing has generated additional results (Appendix I) regarding the behavior of the distortion field as applied to thicker rather than very thin E2 treated materials. The most significant points are listed in the Appendix, and should be included in future studies.

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Appendix I Distortion about a cube shaped material

The following tests were conducted after the initial version of this report was submitted.

Field distortion in thick blocks of material subject to E2 processing

The blocks of material listed in Table 2 were subjected to E2 processing about 1.5 years before the properties of the edge effects were measured and recorded. The blocks were cubical with dimension 2.5 cm. on each edge.

Table 2 Edge Effects on a Variety of Materials Treated with E2 Processes

Material	Retained Field Distortion	Conducts Field	Distortion Location	Additive Strength
Acrylic	yes	yes	edge	strong
Nylon	yes	yes	edge	strong
PVC	yes	yes	edge	strong
Pine	yes	yes	edge	weak
Poplar	yes	yes	edge	weak
Maple	yes	yes	edge	weak
Aluminum	no	no	none	none
Iron	no	yes	none	none
Copper	no	yes	none	none
Brass	no	yes	none	none

The strongest edge effects were in the polymer cubes, followed by the wood samples. The metal retained no edge effects. The distortion field existed entirely on the edge of the cubes with no distortion measurable away from the edge on the body of the cube. Where an edge gave a clockwise rotation, the edge across the cube gave a counterclockwise rotation.

When multiple cubes were stacked “in series”, the edge effects were additive - strongly for the polymers, and less strongly for the wooden samples. The metals added nothing, and allowed the source edge effect to pass through offering no shielding, however aluminum blocked the edge effect from passing.