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Hypotheses for Mechanism of Influence and Technical Mitigation of Negative Bioreactivity from Stray Current Propagated along Magnetotelluric Anomalies

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Abstract: ***Earlier results, where unknown emissions from a magnetotelluric anomaly shifts water pH even when the water is fully shielded from electric, magnetic and electromagnetic fields has been re-analyzed. We formulate a new hypothesis for understanding this strange behavior. We present a new measurement protocol for further investigation and we test the developed hypothesis by rigorous experimentation.***

Keywords: Magnetotelluric Anomaly, Stray Current, Water, pH, Biomass, Vortex

1. Introduction

Since 2018 we have been engaged in a multi-year research project aiming to both 1) elucidate the mechanisms for the observed negative bioreactivity for farm animals subjected to stray current and 2) develop robust, effective and well-documented strategies for technical mitigation of such adverse effects.

During a field measurement some peculiar characteristic of the electrical field associated with magnetotelluric anomalies was discovered. This characteristic made it possible to develop a new hypothesis about the mechanism by which a stray current propagating magnetotelluric anomaly can influence water pH. On this basis it has even been possible to develop a new strategy for technical mitigation of the adverse effects of stray current.

2. Literature Survey

I 2019 it was shown that impedance characteristics for water subjected to the presence of a stray current propagating magnetotelluric anomaly changed significantly [1]. This was the first result of its kind – and created some controversy, as no changes could be indicated by classical chemical analysis.

Later analysis [2] developed a more field applicable methodology for analyzing the effects on water by measuring pH, noting that pH-measurement is vastly used as a readily measurable proxy for internal water structure [3,4]

It was furthermore shown [5] that the mechanism responsible for influencing pH does not attenuate by either selective or combined screening of electric, magnetic and electromagnetic fields.

A specific magnetic field measurement protocol and excavations enabling direct measurements in the conductive subsoil layers demonstrated [6, 7] the existence of electrical conductive strata as on of the prime technical explanations for the phenomenon of a stray current propagating magnetotelluric anomaly.

For some of the affected farmers this was a major milestone, as the presence of such magnetotelluric anomalies had been doubted officially, especially as the farmers claiming negative effects from such structures often only could locate these by dowsing or similar subjective methods. Developing a stringent technical measurement methodology helped immensely to drag this concept into the realm of measurable facts.

3. Problem Definition

This study aims to both describe the development of a new hypothesis for the interaction between the electrical fields of a stray current propagating magnetotelluric anomaly and biological systems - and analyze the effectiveness of a protective strategy based upon said hypothesis.

4. Methodology

a) The hypothesis

By utilizing a pair of orthogonal parallel-plate-antennas coupled to a pre-amplifier and a oscilloscope it is possible to investigate a special vortex-like characteristics of a stray current propagating magnetotelluric anomaly. This provides the basis for a hypothesis about the mechanism responsible for the observed pH-shift in water subjected to the presence of a stray current propagating magnetotelluric anomaly.

b) The protective strategy

To test if the observed vortex-like field actually was responsible for water pH shift a protective device neutralizing the vortex-field was conceived.

By measuring the constituent waveforms of the vortex field it is possible to work out which set of frequencies which will neutralize the constituent waveforms and thereby collapse the vortex. This process is not fully straightforward and we are in the process of patenting the method.

Once the frequencies has been determined a practical version of a technical protective device can be constructed, using a vector network analyzer to determine resonance frequencies of small samples of different types of quartz, and afterwards combining these resonance frequencies in a resonance unit.

By placing this unit in the center of the magnetotelluric anomaly, we can collapse the vortex field.

c) Verification of the protective strategy

Water pH test was carried out according to the methodology developed in [5].

After the water experiments we designed a more elaborate set of experiments using Lepidium sativum as model organism.

For the first experiment we prepared 12 polyethylene petri dish with a cotton pad as growth media. 50 seeds of Lepidium sativum was sowed in each dish. Both petri dish, cotton pad and seeds was weighed individually, so that the cumulative biomass growth can be calculated when the experiment is terminated.

6 petri dishes ("Exposed") was placed in a magnetotelluric anomaly while the other 6 petri dishes ("Control") was placed in a neutral area.

The seeds was watered, so that the cotton pads were kept moist throughout the experiment. Runtime for the experiments was 10 days, after which the setup was air-dried before weighing, so that the dry biomass growth could be determined.

5. Results & Discussion

a) The hypothesis

It was, by mere chance, noted that the presence of a magnetotelluric anomaly is accompanied by a substantial phase difference between two electrical fields.

To further analyze this observation a simple measurement apparatus was conceived, as shown in figure 1.

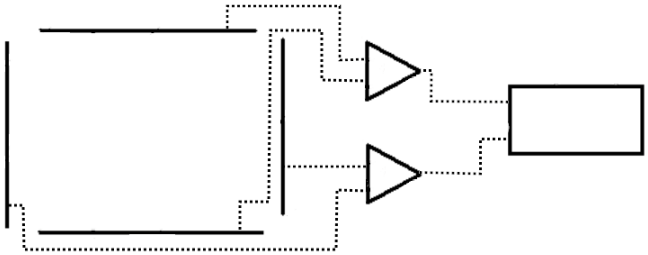

Figure 1: Two opposing parallel-plate capacitors form the antenna array. The signal from these are fed to two pre-amplifiers before the amplified signal is connected to two channels in a oscilloscope.

We note empirically, that whenever a measurement is taken directly over a magnetotelluric anomaly, we find two electric fields with a phase delay approaching 90 degrees.

If we view this on a oscilloscope in XY-configuration we see a circle – or, if you imagine the same structure developing either over time or over distance – a vortex-like figure.

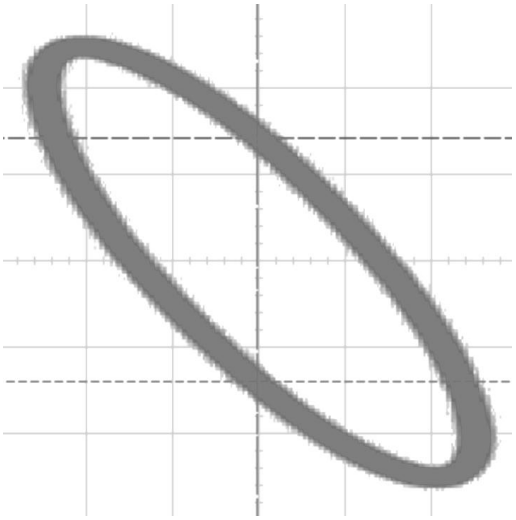

Figure 2: Static image from the oscilloscope. When viewed in real-time the circle slowly rotates. The chirality of this rotation seems important, as all of the magnetotelluric anomalies investigated with this technology has indicated left hand rotation of the vortex.

We note empirically that whenever this peculiar waveform is present, then we can observe water pH shift, even if the water sample is shielded from magnetic, electric and electromagnetic fields.

We hypothesize that this vortex-like structure produces some unknown characteristic enabling the vortex-field to affect water even when the water is totally shielded. The mechanism could be related to translation effects between spin coherence in the molecules of both water, air and shielding enclosure and the observed spinning electric vortex.

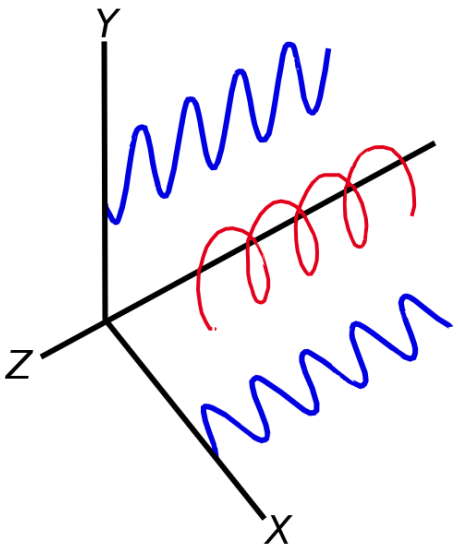

Figure 3: Graphical illustration of the vortex hypothesis, where two parent phase-delayed electrical fields are combined to a vortex.

b) Strategy for technical protection

It was noted that when the selected quartz crystals are assembled and cast in resin the unit shows some level of protection already before turning the signal generator on. We suppose this is explained by the piezoelectric effect.

Taking advantage of the above mentioned observation we constructed two different embodiment of the described idea.

One, with external excitation of the crystals, dubbed "Field Sentry" and one without external excitation of the crystals, dubbed "Quantum Helix".

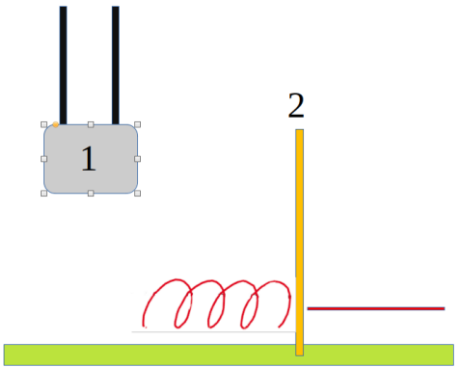

Figure 4: Schematic illustration protective device enabling collapse of the vortex field. 1) represents a signal generator tuned to specific frequencies of the constituent waveforms of the vortex. 2) represents the resonance unit positioned in the magnetotelluric anomaly.

The effect of the protective device can readily be viewed on the oscilloscope screen, as the vortex-like figure disappears.

c) Strategy for technical protection

As the ultimate test of any hypothesis is falsification through prediction and experiment, we tested the protective devices for their effectiveness in protecting water against pH shift.

The initial experiment is designed to verify both the effect of the magnetotelluric anomaly, and that we have chosen a suitable spot for our unexposed control.

Table 1: Results from first water tests demonstrates negative pH shift identical to what has been observed in former experiments.

Water test 1		
	Vortex Field	Unexposed control
1	6,388	6,613
2	6,372	6,585
3	6,302	6,6
4	6,342	6,634
5	6,341	6,601
6	6,498	6,591
Mean	6,373	6,604
T-test $P_{(two-tailed)}$ at alpha=0,05: 0,00067		

We note a considerable and statistical significant pH shift, which confirms that we can proceed using the same locations for the next batches of experiments.

For the next test we installed a Quantum Helix protective device in the magnetotelluric anomaly and proceeded as per methodology in [5]. Water samples was placed at same spot in all tests.

Table 2: Results show no significant difference, which demonstrates that the effect conferred upon the water in experiment 1 has been neutralized

Water test 2		
	Quantum Helix	Unexposed control
1	6,635	6,639
2	6,625	6,616
3	6,617	7,713
4	6,612	6,618
5	6,626	6,581
6	6,654	6,620
Mean	6,628	6,797
T-test $P_{(two-tailed)}$ at alpha=0,05: 0,40222		

Although not significant, we do observe a numerically smaller mean pH value for the water exposed to the magnetotelluric anomaly, even though it's effects should be blocked by the Quantum Helix.

For the next test we installed a Field Sentry protective device in the magnetotelluric anomaly.

Table 3: No significant difference is found, which means that the mechanism affecting water pH has been neutralized.

Water test 3		
	Field Sentry	Unexposed control
1	6,24	6,628
2	6,629	6,586
3	6,604	6,663
4	6,621	6,597
5	6,699	6,605
6	6,626	6,513
Mean	6,569	6,598
T-test $P_{(two-tailed)}$ at alpha=0,05: 0,71981		

Here we note a much smaller difference in mean pH. We could possibly infer from that observation that the Quantum Helix developed for the experiment possibly wasn't strong enough. The Field Sentry is, however, strong enough to keep water pH nearly unchanged.

We proceeded with the next batches of experimentation, using Lepidium sativum as our model organism.

Table 4: Cress growing on top of a magnetotelluric anomaly ("Exposed") presents considerably and significantly smaller biomass growth than cress growing in a neutral place.

Lepidium sativum biomass test 1		
	"Exposed"	Unexposed control
1	2,1	3,9
2	0,9	2,4
3	1	1,8
4	0,3	2,4
5	0,2	2
6	0,4	1,2
Mean	0,81	2,28
T-test $P_{(two\text{-}tailed)}$ at alpha=0,05: 0,00125		

We observed a rather stunning difference in biomass growth between the exposed and non-exposed cress-dishes in batch 1. This confirms out general idea, that biomass growth can be used to investigate unknown emissions from magnetotelluric anomalies. Farmers has made similar (subjective) observations, both regarding crop yield and piglet weight gain per kg of feed. In all instances a reduction in biomass growth has been observed, whenever the biological system is located on (or nearby) a stray current propagating magnetotelluric anomaly.

We repeated the same experiment, except that the magnetotelluric anomaly was neutralized by the Field Sentry technology.

Table 5: The two means does not differ significantly, demonstrating that the Field Sentry technology is neutralizing the effect from the magnetotelluric anomaly

Lepidium sativum biomass test 2		
	Field Sentry	Unexposed control
1	1,8	1,8
2	1,9	1,7
3	1,9	1,8
4	2,2	1,8
5	2	1,9
6	2,3	1,6
Mean	2,01	1,76
T-test $P_{(two\text{-}tailed)}$ at alpha=0,05: 0,06428		

We note that in experiment 1 it is evident that the cress subjected to the unknown emission from the magnetotelluric anomaly consistently shows smaller biomass growth than the cress which has grown in a neutral place. For experiment 2 the opposite is true, here the mean value is, although not statistically significant at alpha=0,05, still exhibiting a general trend supportive of the idea that the Field Sentry technology actually increases plant growth potential.

Table 6: When the unknown emissions from the magnetotelluric anomaly were neutralized with Quantum Helix technology we observed a slight increase in biomass growth compared to cress placed in a neutral location.

Lepidium sativum biomass test 3		
	Quantum Helix	Unexposed control
1	1,4	1,2
2	1,4	1,3
3	1,3	1,3
4	1,3	1,1
5	1,3	1,3
6	1,3	1,2
Mean	1,33	1,23
T-test $P_{(two\text{-}tailed)}$ at alpha=0,05: 0,04085		

6. Conclusion

We have developed a conceptual hypothesis to explain why magnetotelluric anomalies can influence water pH even when fully shielded against influences from electric, magnetic and electromagnetic fields. We have developed a measurement protocol by which the phase-delayed standing and reflected waves, hypothesized to be responsible for the hypothesized vortex field can be readily measured with standard electronic measurement tools.

The hypothesis withstood its first major falsification attempt, as the protective devices constructed on the basis of the hypothesis, demonstrated significant effectiveness.

The hypothesis is, for now, presented as a graphical concept. Coupled with technical measurements of the parent phase-delayed waveforms this conceptual understanding was sufficient to construct the protective devices, but we need more research to enable a complete mathematical modeling of the combinations of the parent waveforms into the hypothesized vortex. A generalized mathematical model would enable this research to advance further, as more precise predictions (and subsequent falsification attempts) can be investigated.

7. Future Scope

Further research is needed to investigate this phenomenon. From our small dataset it seems plausible that an unknown emission from the magnetotelluric anomalies has a considerable influence in both water pH and growth rate. This could be important both as a mitigative strategy for farms negatively affected by magnetotelluric anomalies, but could possibly also have profound implications for general agriculture.

The protective devices, originally developed as a experimental device to subject our hypothesis to falsification by experiment, has already been installed at a number of farms. Initial reports are very good, when data becomes available we will endeavor to publish follow-up reports.

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Author Profile

Kim Horsevad is the owner and chief technical analyst at Horsevad Independent Technical Research & Analysis (www.horsevad.net). Current research aims for developing methods for quantifying interactions between electromagnetic fields and biological systems.

Juelie S. Renkilde Pedersen is a plant collector and independent biodynamic horticulture specialist, whose work focuses on researching ethnobotanical and pharmaceutical aspects of cultivated and non-cultivated plants. She is the owner of "Den Kosmiske Blomst", where she teaches courses in biodynamical horticulture.