Open Journal of Earthquake Research, 2023, 12, 1-25
https://www.scirp.org/journal/ojer
ISSN Online: 2169-9631
ISSN Print: 2169-9623

An Attempt to Analyze a Human Nervous System Algorithm for Sensing Earthquake Precursors

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How to cite this paper: Cao, D. (2023) An Attempt to Analyze a Human Nervous System Algorithm for Sensing Earthquake Precursors. *Open Journal of Earthquake Research*, **12**, 1-25.
https://doi.org/10.4236/ojer.2023.121001

Received: February 7, 2023
Accepted: February 25, 2023
Published: February 28, 2023

Abstract

We statistically validate the 2011-2022 earthquake prediction records of Ada, the sixth finalist of the 2nd China AETA in 2021, who made 147 earthquake predictions (including 60% of magnitude 5.5 earthquakes) with a prediction accuracy higher than 70% and a confidence level of 95% over a 12-year period. Since the reliable earthquake precursor signals described by Ada and the characteristics of Alfvén waves match quite well, this paper proposes a hypothesis on how earthquakes are triggered based on the Alfvén (Q G) torsional wave model of Gillette *et al.* When the plume of the upper mantle column intrudes into the magma and lithosphere of the soft flow layer during the exchange of hot and cold molten material masses deep inside the Earth's interior during ascent and descent, it is possible to form body and surface plasma sheets under certain conditions to form Alfven nonlinear isolated waves, and Alfven waves often perturb the geomagnetic field, releasing huge heat and kinetic energy thus triggering earthquakes. To explain the complex phenomenon of how Ada senses Alvfen waves and how to locate epicenters, we venture to speculate that special magnetosensory cells in a few human bodies can sense earthquake precursors and attempt to hypothesize an algorithm that analyzes how the human biological nervous system encodes and decodes earthquake precursors and explains how human magnetosensory cells can solve complex problems such as predicting earthquake magnitude and locating epicenters.

Keywords

Earthquake Prediction, Earthquake Precursors, Mantle Column Plume, Asthenosphere, Alfven Isolated Waves, Human Magnetic Induction Cells, Neuronal Spikes, Bayesian Algorithm

1. Introduction

In the past two decades, the search for seismic electromagnetic signals has become a popular research in the seismological community, and seismologists have turned their attention to the increasingly sophisticated big data machine algorithms, expecting to find a breakthrough and uncover convincing earthquake precursor signals. During the qualification review for the final round of the 2nd AETA (Artificial Intelligence for Earthquake Prediction) Competition 2021 held by the Shenzhen Research Institute of Peking University in China, the organizing committee found that Ada, which ranked 6th overall, *i.e.*, did not use the 91 types of earthquake precursor data identified by the competition, nor did it use any machine algorithms. Ada claimed to rely on extraordinary function of human body for earthquake prediction, who not only won the eighth week of the competition, but was the first contestant to accurately predict the powerful 6.4 magnitude earthquake that struck Dali, Yunnan, China, on May 21. Ada's final prediction accuracy over the 30-week competition ranked first. If we add that he also correctly predicted earthquakes in Guangxi and Qinghai, two areas outside the contest's specified range, during his participation, the prediction accuracy rate reached 70% (cite Supplementary Material [1]). This paper counts 20 pages of historical records of Ada's earthquake forecasts published by the Chinese amateur earthquake research website "Earthquake Forum" (https://www.dizhentan.com) since 2010. 146 earthquakes were predicted by Ada from 2011-2022, 98 of which were predicted to be of magnitude 5.5 or greater, accounting for 67% of the total predictions, with a magnitude. The average time difference (actual time of occurrence – minus predicted time) of earthquake prediction is 10.7 days, which is basically in line with the international standard for earthquake prediction. Of the total earthquake prediction records, Ada was more successful in predicting 68 strong earthquakes of magnitude 6 or higher, accounting for 46% of the total, and 13 strong earthquakes of magnitude 7 or higher. The correlation coefficient calculated by predicted and actual magnitudes was 0.78.

Ada's formula for the 95% confidence interval between the predicted and actual occurrence of an earthquake

$$0.5 \pm 1.96 * 0.44/12.1 \quad \bar{x} = 0.5 \quad n = 147 \quad z = 1.96 \quad s = 0.44 \quad \sqrt{n} = 12.1$$

$$\bar{X} + Z * S/\sqrt{N} = 0.42$$

$$\bar{X} - Z * S/\sqrt{N} = 0.57$$

Confidence interval = 0.42 - 0.57

That is, the prediction is in the 95% confidence interval of 0.42 - 0.57.

Cite (**Supplements 1-3**)

These statistics provide a proof worth studying—the signals of earthquake precursors sensed by human supernormal capabilities are quite reliable and stable. The official records of the AETA competition in China also confirm the ability of human supernormal capabilities for earthquake prediction from another side.

While earthquake prediction is already controversial among some mainstream seismologists, relying on the human body's ultra-sensitive magnetic perception to sense earthquake precursors thousands of kilometers away seems even more implausible. Some mainstream classical seismologists assert that "earthquake prediction research has been conducted for more than 100 years with no apparent success. Claims of breakthroughs do not stand up to scrutiny. Extensive searches have failed to find reliable precursors. Theoretical work suggests that faulting is a nonlinear process that is highly sensitive to a large number of unmeasured fine details of the Earth's state, not just in the vicinity of the source." [1]. Therefore, before analyzing the seemingly unscientific explanations for the phenomenon of human idiosyncrasies predicting earthquakes, it is necessary to briefly explore the mechanism of critical earthquake triggering.

In 2020, Gillette *et al.* proposed a geocentric Alfvén (Q G) wave model with a period of 6 - 12 years involving (inertia, magnetism, buoyancy) in the analysis of the perturbed geomagnetic field [2], They mainly used (QG) Alfvén waves for the analysis of the long-term dynamics of geomagnetic field variations. The (QG) Alfvén wave is also limited to fluctuations in the periphery of the Earth's core. Based on the idea of Gillette's model, we venture to assume that a nonlinear Alfven solitary wave mode may also exist between the Asthenosphere and the upper mantle. The mechanism of its generation is as follows.

These kinetic masses are hotter and lighter in the rising mantle column plume compared to the cooler masses in the lower mantle. According to geophysical probes, large and small mantle columns are distributed in major plates around the globe. Under normal conditions, the magma of the soft flow circle flows along the subsurface channels under each plate, and the exchange of magma between the upper mantle and the soft flow circle obeys the angular velocity of the Earth's rotation under normal conditions, and the inertial force of the magma with the Earth's rotation is greater than the magnetic and buoyancy forces.

Australian and New Zealand geophysicists studying the mantle of the Olympic Dam area in South Australia and Taupo Volcano in New Zealand have found that magmas in the lithospheric margin of the Australian mantle and in siliciclastic formations in New Zealand have unusually high electrical conductivity. Recent mining has revealed the presence of highly conductive hematite, chlorite and graphite ores, and Fe-Au-Cu-Ni alloy bodies in the upper mantle of certain regions of the Earth, and these magnetic-rich materials provide favorable conditions for the formation of plasma [3] [4] [5].

Although the plasma material of metallic mineral particles in the mantle column plume is unevenly distributed and very little, it is enough to make the magma in the soft flow layer much more conductive. When the upper mantle plume intrudes into the lithospheric interstices of the soft flow layer, the gases preserved in the rocks are ionized in large quantities, and in the ion-solid interaction, it is possible to form Bulk and surface plasma to make the magmatic fluid conductivity increase suddenly. Meanwhile, to borrow the term of photovoltaic cell, we also not excluded that the post-calcite material in the lower mantle rises with the mantle column to form a power generation effect similar to a natural magnetic voltaic cell, to borrow the term of photovoltaic cell, to produce magma with high electrical conductivity [6] [7].

If the semi-liquid or semi-solid material or highly conductive magma existing in the upper mantle and Asthenosphere is regarded as suboptimal magnetic fluid, when the upper mantle column plume accelerates upward and intrudes into the soft current layer to overflow from the hot spot, the magma within the soft current layer can completely randomly form small-scale eddies and turbulence in some geographical areas. And these mantle column plumes containing plasma material in the rising state perturb the geomagnetic field with local Alfvén wave and small-scale frequency, and have the conditions to generate local magnetic reconnection randomly. In this process, the magnetic reconnection converts the huge magnetic energy into kinetic and thermal energy, and excites the nonlinear Alfven isolated wave at the same time. Alfven solitary waves can travel thousands of kilometers, which can cross the seawater, rocks and other media arbitrarily, accelerate the huge electron population, and transfer a large amount of thermal energy without decay [8] [9]. Therefore, in specific seismic zones where magnetic forces exceed inertial forces leading to accelerated lithospheric fracture layer motion, even if the magnetic reconnection is localized in a small area, Alfven solitary waves may produce a triggering "trigger effect" that induces critical fracture or slip dislocation of the lithosphere, triggering a huge transient stress release accumulated in the Earth's plate this may eventually lead to earthquakes, especially strong earthquakes.

In the following, a simplified mathematical formula is used to express this seismic trigger mechanism.

First, a static equilibrium model of the pre-earthquake plate lithosphere is given.

$$EP - RB = 0 \text{ , in finite time} \tag{1.1}$$

where EP is the subduction force potential energy of plate displacement and RB is the frictional resistance of the rock that temporarily prevents the plate from sliding. Let the subduction force of the plate be proportional to the angle of plate flexion, and take the 45˚ of a trench measured by Japanese geophysicists as an example, the steeper the angle of plate flexion, the greater the corresponding subduction giant thrust.

The self-weight of the plate is a function of the acceleration of gravity, the approximate weight of the plate is replaced by the sliding area SLa of the plate, and gv is the acceleration of gravity; then

$$EP = \sin\theta * SLa * gv \text{ ,} \tag{1.2}$$

To simplify the problem discussion, consider that the frictional resistance RB depends on two factors.

1) the hardness of the rock F, 2) the volume of the rock V.

That is,

$$RB = F + V\ ; \tag{1.3}$$

Substitute Equations (1.2) and (1.3) into Equation (1.1)

$$EP - RB = \sin\theta * SLa * gv - (F + v) = 0\text{, the}$$

Now add the effect of Alfvén solitary waves on frictional resistance.

There are two conditions for generating Alfvén waves.

Astronomical space physicists have identified solar flares or solar winds that produce dynamical Alfvén waves, or DAWs for short.

The theoretical assumption is that dynamical Alfvén waves can also be generated inside the Earth.

A synthesis of astrophysicists' research on Alfvén wave energy is broadly based on the following three points.

Kinetic Alfvén waves generate strong currents, electric fields and shock waves in the solar atmosphere, which may accelerate fast particles.

The ohmic dissipation of Alfvén waves in the plasma sheet current converts part of the magnetic energy into heat.

The presence of a strong Lorentz force accelerates the plasma to high speeds.

The heating mechanism of kinetic Alfvén waves, magnetohydrodynamics, suggests that DAWs can accelerate charged particles, which is a major factor in the temperature of the corona being several million degrees higher than that of the solar surface [10].

Let the electron density ∂ be the partial differential of time $t\,\partial\psi/\partial t$.

The thermal energy function generated by the acceleration of the electron is:

$$T\eta(t) = \int \psi w^2(x,t)\,\mathrm{d}x\ , \tag{1.4}$$

The symbols indicate: ψ is the electron density, $T\eta$ is the temperature change, W is the work, c is the acceleration, ρ is the density, and u is the plasma flow rate, where p is the pressure, u is the fluid velocity, E is the energy, and B is the magnetic field.

Based on the energy properties of Alfvén waves, it can be assumed that the abnormally high temperature of the soft-flow layer magma heated by Alfvén waves causes phase changes of the material inside the rock, leading to partial collapse of the lithosphere. The hardness of rocks is expressed by the internationally used Pratt's hardness coefficient f value, which is calculated as $f = R/100$, where. R is the rock's uniaxial compressive strength in megapascals.

Let the rock hardness Δf decrease with time t, as well as the volumetric phase change of the rock due to the structural phase change caused by the sharp rise in temperature, and substitute Equation (1.3) into Equation (1.2)

$$F = F - \Delta f = \mathrm{d}f/\mathrm{d}t\ ,\quad \Delta f = 0.01 * R - \Delta T\eta(t) = 0.1 * R - \mathrm{d}T\eta/\mathrm{d}t\ , \tag{1.5}$$

Let the amplitude generated by the transverse resonance of the Alfvén solitary wave be $\partial\hat{u}/\partial t$.

The momentum equation of the Alfvén wave is

$$\partial B/\partial t + \rho(u * \nabla)u = 1/c * j * B\ , \tag{1.6}$$

$$\partial B/\partial t = \nabla(u * B),$$

$$D\rho/Dt = -\rho(\partial u/\partial x + \partial v/\partial y + \partial w/\partial z), \quad (1.7)$$

The above equation shows that the change in density (with time and position) is equal to the product of density and volume deformation.

To prove that $\sin\theta * SLa * gv - RB2 > 0$, the calculation is simplified by taking the nonlinear trend of the rock fracture and making it locally linearly separable, the decreasing trend of the rock volume is influenced by two factors.

A) Due to the high temperature generated by Alfvén waves, the phase change in the rock structure causes the rock material to become brittle and its hardness to decrease, *i.e.* $\Delta f = F - \Delta e(t)$.

B) The volume of the rock tends to decrease due to the high temperature generated by the Alfven wave and the torque force of the transverse resonance, *i.e.*, $\Delta v = V - D\rho/Dt$, such that every point $x \in (\Delta f/\Delta t, D\rho/Dt)$ has $f'(x) < 0$, then f is decreasing on $[\Delta f, \Delta v]$.

This can be explained by the fact that the rock friction resistance *RB*2 tends to decrease under the influence of Alfvén waves.

That is:

$$RB2\,\mathrm{d}f/\mathrm{d}t - RC/10 - \mathrm{d}T\eta/\mathrm{d}t < RB, \quad (1.8)$$

Substituting Equation (1.4) into $RB = \mathrm{d}f/\mathrm{d}t - 0.01 * R - \mathrm{d}T\eta/\mathrm{d}t$

The above equation can be expressed as follows: the rock frictional resistance *RB*2 tends to decrease under the influence of Alfvén waves, *i.e.*,

$$RB2 = \mathrm{d}f/\mathrm{d}t - 0.01 * R - \mathrm{d}T\eta/\mathrm{d}t$$

Derived from: $RB > RB2$

Substituting Equation (1.7) into the plate kinetic energy static equilibrium I equation, we get

$$\sin\theta * SLa * gv - \mathrm{d}F/\mathrm{d}t - RC/100 - \mathrm{d}T\eta/\mathrm{d}t > 0$$

The above equation expresses that even under the constant giant thrust of plate subduction, the frictional resistance of rocks originally in static equilibrium is weakened by the anomalously high temperature and lateral resonance torque force generated by the Alfvén solitary wave, leading to local collapse and volume reduction of the lithosphere, which eventually makes the plate subduction force larger than the frictional resistance, proving that the condition that the Alfvén solitary wave serves to trigger the critical occurrence of earthquakes is sufficient.

Let us add some strong supporting evidence to the above theoretical hypothesis by citing actual events, calculated from space physicists' observations of dynamical Alfvén (DAW), a kinetic source of superheated electrons in the magnetically reconnected X-ray region up to 300 keV. 300 keV of high thermal energy light means that penetration into engineered materials such as metals can be on the millimeter, or even centimeter, scale. 50% of the magnetic energy is converted into particle energy, of which 2/3 is converted into ions and 1/3 is converted into electrons. Magnetic reconnection is the basic physical process of plasma, where the stored magnetic energy is converted into thermal and kinetic energy of charged particles. Ultra-high energy cosmic rays can also produce high energy acceleration of 1019 eV, which is far beyond the current reach of human science and technology [11] [12] [13].

In observing earthquake precursors and anomalous climate change over a long period of time, Ada noticed an important event; basically every strong earthquake was preceded by a general warming spanning thousands of kilometers. Japan's 1995 Hanshin earthquake was preceded by record-breaking heat that sold out not only air conditioners but also electric fans from Japanese appliances. m-class solar flares erupted on Jan. 15, 2023, and strong earthquakes of magnitude 6 and 7 occurred in the Sumatra and Maluku seas of Indonesia on Jan. 16 and 18. 3000 kilometers away, Fuzhou suddenly warmed up 5 degrees from its cold climate on Jan. 15, and Many people switched to wearing shirts. Immediately after the solar flare outbreak, temperatures returned to normal cold winter levels. Assuming that the temperature before the earthquake was positively correlated with the energy burst inside the Earth, the specific heat capacity of air at regular air pressure is 1006 Joules/Kg/degree and the density of air is 1.29 kg/m^3, which requires 12.9 Joules of heat per cubic meter of air to raise the temperature. According to a rough calculation of a 5 degree temperature rise in Fuzhou before the earthquake, the air within 3479 km from Indonesia to Fuzhou is 3479 × 1000 cubic meters, so a 5 degree temperature rise is equivalent to generating 1.74×10^2 joules of heat energy. This is only the surface temperature. If we assume that the Alfven solitary wave is generated in the soft fluid layer, the energy to heat the magma and lithosphere is even greater.

On February 6-7, 2023, two strong earthquakes of magnitude 7.8 occurred in the Anatolia region of Turkey, and it is no coincidence that both local media and individuals took pictures to the eerie blue EQL reappeared and posted on videos and tweets. In the context of today's highly developed internet technology, it is impossible to fake these pictures and videos. In spectroscopy, blue is the highest temperature visible light. Reliable historical sources have recorded the appearance of blue EQL before a super-strong earthquake of near magnitude 8, as shown below

Tangshan, July 28, 1976 7.8 magnitude.

Peru, August 15, 2007 Magnitude 8.

Chile, February 27, 2010 8.8 magnitude.

Mexico, September 7, 2017 8.4 magnitude.

Mexico, September 8, 2021 7.1 magnitude.

Turkey February 6, 2023 7.8 magnitude.

Among them, the media records of the blue EQL of the 8.2 strong earthquake in Mexico in 2017 and and the 7.8 strong earthquake in Turkey on Feb. 6, 2023 are particularly clear. According to the latest research by astrophysicists on auroral research for nearly a decade, three conditions are necessary for aurora production: a large number of charged energetic particles, atmosphere and magnetic field, and the appearance of aurora is closely related to the acceleration of charged particles by Alfvén waves. EQL is very similar to aurora in appearance, but the difference is that the large number of charged particles that produce blue EQL are not solar wind charged particles, but are produced from the asthenosphere and lithosphere. According to spectroscopy, blue is the highest temperature visible light, and the blue EQL indirectly supports that not only Alfvén waves were generated in the lithosphere before the strong earthquake but also magnetic reconnection occurred, which led to the blue flash with high temperature characteristics in the epicenter region. In other words, the blue EQL can be considered as an alternative spectral phenomenon to the "aurora" [14]. Cite **Supplement 3** the Figs website.

Due to the anisotropy of each seismic zone (including the gravity of the lithosphere, the degree of rupture, the conductive heat flow in the upper mantle, etc., and the different differences in the content of nuclear decay elements), each local Alfvén wave from different sources is a nonlinear, nonsinusoidal isolated wave. This implies that the random, locally formed kinetic Alfvén isolated waves in the area of impending earthquakes contain at least three earthquake precursor information, *i.e.*, magnitude, epicenter extent, source depth, and the brewing or imminent earthquake. Deciphering the seismic precursor signals embedded in Alfvén waves is equivalent to mastering the key to short-term earthquake prediction. However, the current state of science and technology makes it difficult to simulate Alfvén waves from cosmic-sized Earth or planetary objects and the rapid disappearance of local small-scale Alfvén isolated waves generated instantaneously, and it is not an easy task for geophysicists and astrophysicists to observe Alfvén isolated waves.

So how do human idiosyncrasies perceive Alfvén waves and predict earthquakes?

It is generally accepted that the human senses are sight, hearing, smell, touch and taste, but there is a more important sense among the biological senses, and that is magnetism, a phenomenon in which nerve cells produce bioelectric impulses and magnetic sensations under the action of changes in external electromagnetic fields. Magnetism is more common in animals, such as migratory birds and sea turtles, although magnetic abilities are also present in humans, except that most are insensitive or completely degraded. Over the long three million years since the birth of life on earth, Darwin's natural law of survival of the fittest and survival of the fittest has proven that a few animals, including very few people, have developed extraordinary and exceptionally powerful genetic structures during the long process of natural evolution. The French TV2 program "The Extraordinary Power of the Human Body" discovered in 2020 that a female painter in New Zealand has the ability to discern four colors differently from normal humans. And the robin's auto-navigating biological compass, which undergoes thousands of kilometers of migration each year, has been one of nature's elusive mysteries. In the latest research, quantum neuroscientists have discovered the presence of very sensitive magnetic proteins in the robin's brain [15] [16].

Therefore, we define that, in a very small number of people, due to factors such as genetics and special training over time, the specially developed magnetic sensing ability in the nervous system is also one of the special functions of the human body.

According to Ada's self-report, starting from 1993, he found that a few days before each earthquake of magnitude 5 or higher occurred in the world, his upper body would experience a soreness, pain, numbness, swelling and heat similar to being pricked by pins and needles. Ada clearly realized that earthquake prediction must meet the three elements of predicted time, predicted magnitude, and predicted epicenter location, and at that time he did not master how to predict the epicenter location, so he only took earthquake prediction as a hobby and never published earthquake prediction publicly. In order to verify that his body could indeed sense earthquake precursors, Ada spent more than 10 years to determine the reliability of the signals of earthquake precursors sensed by his body. This illustrates Ada's rigorous scientific approach to earthquake prediction on the one hand, and the need for the phenomenon of the human body sensing earthquake precursors to be tested by the law of large numbers on the other.

The magnitude 9 earthquake in Indonesia in 2004 was a watershed in the history of Ada's amateur earthquake research. For more than a month before the powerful earthquake in Indonesia, Ada felt pain in his lower extremities like torn nerves and for a while thought he was suffering from a strange disease. However, after the massive tsunami on December 26, 2004, Ada's body returned to full normal health, which gave him two new insights.

1) The size of an earthquake is proportional to the strength of the bioelectrical impulses caused by the body sensing the precursor signal of the earthquake.

2) The range of the epicenter may correspond to different meridian systems of the human body.

In 2008, he sensed a strong earthquake precursor signal a week in advance and predicted for the first time on the Internet that "an earthquake as strong as the tsunami in Indonesia is about to happen, probably in the southwest." In early February 2011, he sensed frequent strong earthquake precursor signals and predicted that a strong earthquake of magnitude 7 or more would occur between Korea and Japan based on the unusual climate in Korea, where a major snowsstorm occurs only once in 50 years. He predicted that a strong earthquake of magnitude 7 or higher would occur in the sea between Korea and Japan. Shortly thereafter, the March 11 earthquake occurred in Japan. Since 2012, Ada has gradually figured out how the different acupuncture points in his body correspond to the predicted epicenter.

Among the few amateur researchers of earthquake prediction in China, there are also those who claim to have supernormal capabilities. Skeptics claim that this is nothing more than blindly guessing earthquakes in high-frequency seismogenic regions using random probabilities of a dice roll, which anyone can do. A simple and effective way to verify these common doubts about pseudo-extraordinary abilities is to apply the double difference method. We divided Ada's earthquake prediction records into two groups with those of others, and the evaluation clearly showed that Ada essentially predicted only one possible seismic event in a specific geographic area at a time. The other group of forecasters, however, predicted earthquakes that could occur in as many as five or more geographic regions from east to west and north to south on a global scale. The accuracy of Ada's predictions differed significantly from that of the other group, both in terms of epicenter location and magnitude and other earthquake prediction metrics, which greatly confirmed Ada's ultrasensitive magnetic sensing capability.

According to Ada's self-report, he is not relying on his ears nor using his eyes and other senses to forecast earthquakes, so the precursor signals of earthquakes sensed by Ada cannot be infrasound, visible spectrum and explosive sound waves below the surface. Electromagnetic waves have various frequencies, and high-frequency electromagnetic waves are harmful to human physiology. Ada has relied on his body to perceive the seismic electromagnetic signal for nearly twenty years, so this electromagnetic signal could not be high-frequency electromagnetic waves either, or he would have been seriously ill. Therefore, the existing scientific common sense about the impact of electromagnetic waves of different frequencies on the human nervous system, which can be sensed through the special functions of the human body to the precursor signals of earthquakes, all point to the range of low-frequency or ultra-low-frequency electromagnetic waves.

Ada also shared an important observation experience in that he sensed earthquake precursors with Doppler characteristics. ada had sensed earthquake precursors in Shenzhen and Fuzhou, China, in Heyuan, Guangdong (177 km from Shenzhen) and Yongtai, a suburb of Fuzhou (53 km from Fuzhou), respectively, almost two to three hours after he sensed the precursors. In contrast, the first time he sensed earthquake precursor signals tens of thousands of kilometers away in New Zealand and Chile was more than a week from the actual occurrence of the earthquake.

It is concluded that the closer the regional location of a predictor with human idiosyncrasies is to a certain epicenter, the shorter the time interval between the sensed earthquake precursor signal and the actual occurrence of an earthquake, with an approximate positive correlation between the two, and vice versa. According to geophysicists, Alfvén waves are not only slow, low-frequency, nonlinear transverse oscillations, but also propagate more slowly in dense material of the medium [17]. While the characteristics of the earthquake precursor signals sensed by Ada coincide quite well with those of Alfvén waves, 52 of the world's strong 6.5 magnitude earthquakes predicted by Ada exceeded 10 days, a time difference greater than the original earthquake prediction criteria, the reason for which is also closely related to the depth of the earthquake source. In addition, Ada also found that after a strong earthquake of magnitude 7 or higher in a certain area, it seems that some kind of huge energy different from seismic waves can spread to other earthquake areas to cause "aftershocks", which is contrary to the traditional earthquake theory but consistent with the faster propagation of Alfvén waves from south to north along longitude. Of course, many seismologists have shown that ELFY also has the characteristics of earthquake precursors, the Morchanov *et al.* The study suggests that Alfvén may be converting to ultra-low frequency, very-low frequency electromagnetic waves [16] [17]. Since it is not possible to actually prove from astronomical instrument data that Alfvén solitary wave is indeed a plausible earthquake precursor. We can only assume that the seismic electromagnetic signal induced by Ada's body is a (LFSE) entropic wave. Entropy wave implies a slow, low-frequency electromagnetic wave whose generation mechanism and nature cannot be fully determined yet.

2. Discussion

In the first part of this paper, we provide a statistical record of Ada's 12-year-long earthquake predictions with an accuracy rate higher than 70% and a 95% confidence level of prediction. Here, how the magnetic cells of the ultra-sensitive human nervous system estimate magnitude and epicenter localization in predictions is particularly critical for seismological studies! The study of the special magnetic sensory ability of the human body is not without deliberately exaggerating certain so-called supernatural human idiosyncrasies. The key difference with the prediction of physical instruments is that even if the human biological nervous system is genetically superior again, due to the fact that humans are in a dual cognitive system of sociology and biology, various complex factors interfere with the human nervous system every moment, and in the long run, the human magnetic sensory nervous system is unlikely to exceed the robustness of high-tech physical instruments. Relying on human idiosyncrasies to solve earthquake disaster prevention is also not the ultimate way of earthquake research. Developing instruments that simulate human sensing of earthquake precursors is the ultimate goal of comprehensive frontier scientists seeking major breakthroughs in earthquake prediction.

Seismologists know that after an earthquake, epicenter localization requires multiple base station devices and many complex physical instruments to give the location in the first place. This mysterious mechanism cannot be explained by metaphysics, but requires a comprehensive analysis using modern quantum neurobiology and other cutting-edge fringe sciences.

Drawing on the structure of artificial neural networks, this paper first divides the human-specific biological neural network into three structural layers of nodes.

Layer 1 → input layer: there are special magnetoreceptor cells in Human nervous system, which are magnetoreceptor cells beyond normal sensitivity and have not only genetic advantages, but also independence of magnetoreceptor cells in their bodies due to the brain's high attention to earthquake precursor signals over a long period of time, and the waveform of earthquake precursor signals is prone to rapidly form a step function of spiking neurons.

Layer 2 → Hidden layer—Intermediate neurons and spinal nerves: The winner-takes-all neural network rule makes some intermediate neurons and spinal nerves, with specific channels responsible for modulation dedicated to transmitting earthquake precursors loaded in neuronal spike pulse waveform information. By analogy with a television circuit, after the body's magnetoreceptor cells non-invasively receive the pre-earthquake (LFSE) wave, the intermediate neurons act as spike waveform tuners generated by the body's response to the external magnetic field acting on the ion channels, randomly invoking the memory of the hierarchical clustering (LFSE) spike patterns distributed in the brain and spinal cord nerves, encoding the spike waveform features and assigning gain amplification signal features to the weighting bias values which are then transmitted to the brain.

Layer 3 → Output layer—specific small modules in the cerebral cortex.

The presence of small modules in the prefrontal cortex of the brain dedicated to processing certain types of information, together with a long history of conscious cognitive training highly focused on earthquake precursors, can enable the magnetically sensitive prefrontal cortex of the human brain to use Bayesian functions involved in encoding response (LFSE) waves, evoking features that generate specific neuronal spike patterns, also used to determine (LFSE) waves transmitted from peripheral nerves to the thalamus and prefrontal cortex. In addition, to determine the content of the recovered seismic precursor information, Bayesian posterior probabilities need to be corrected iteratively, and a filtering method similar to Kalman filtering can be used to exclude "noise" and other disturbances of non-seismic precursor signals. The results of earthquake prediction are derived [18] [19] [20] [21].

In Mbaden Babich's studies on ferritin and ion channels, external magnetic fields activate ion channels noninvasively in humans [22] and highly loaded iron particles in ferritin are super-magnetically paramagnetic and can form magnetizing currents; theoretically, two 8-nm ferritins become magnetically saturated in a magnetic field of 1 Tesla, which is sufficient to mechanically deform the cell membrane of ion channels. Thus, we have the important insight that, in contrast to the spiking pattern of sodium-potassium ion channel generation in the long axis of the giant squid discovered by Hodgkin and Huxley in 1962, the neuronal spiking pattern of human magnetoreceptors is dominated by ferritin, which is highly loaded with iron ions. The ion channels of magnetoreceptor cells are constructed from ferritin and copper proteins, which are highly loaded with ferric ions. A group of magnetoreceptor cells can be considered as a magnetoreceptor field on a peripheral nerve, although there are no experimental data to confirm whether human magnetoreceptor cells are voltage-gated ion channels or a chemotaxis of multimeric ligand-gated ion channels [22] [23].

We first explain the mechanism of action of human magnetoreceptor cells from the perspective of voltage-gated ferro-copper ion channels.

The inhibition and excitation of ion channels are controlled by ion pumps, and most channels exhibit three basic states: closed, open, and quiescent. Ferritin and copper proteins are commonly found in human blood, and ferritin has strong paramagnetic properties. When Alfvén solitary waves formed in the soft current layer and lithosphere before an earthquake penetrate non-invasively into the body, two or more highly loaded ferritin ferritins generate sufficiently large magnetizing currents in a superparamagnetic state. When the current in a population of ferritin neurons reaches a threshold, a mutual electric potential can be induced in the next adjacent ferritin neuron, generating a transmembrane potential that sequentially opens the ferric ion channel. Copper ions have very good conductivity, and when the ferric ion current in the cell membrane reaches a threshold, copper proteins, one of the neurotransmitters, can transmit the spike pattern to the interneurons and the brain. Copper, on the other hand, is antimagnetic and will not form a transmembrane potential without a sufficiently large current. In this way, ferritin and copper proteins constitute a special set of excitatory and inhibitory voltage-gated ion channels in which step voltages of the Dirac δ function appear in iron and copper ion channels only under the action of an external magnetic field, *i.e.*, similar to an Alfvén isolated wave that generates a sufficiently large transverse oscillation amplitude. Unlike Hodgkin and Huxley's sodium and potassium ion channels that produce sterically similar isolated spikes in neurons, the assumption that action potentials do not carry any information is inconsistent with the fact that nonlinear Alfvén isolated waves contain seismic precursor information, whereas nonlinear neuronal spike pulse signals in the presence of (LFSE) waves certainly contain rich seismic precursor information in the waveforms and spikes. Theoretically, the particularly sensitive magnetoreceptor cells and the supramagnetic paramagnetic ion channels composed of iron and copper ions in the human body are far stronger than the information transfer of the Hodgkin-Huxley ion channels in ordinary human nerve cells, both in terms of membrane conductance and membrane voltage, and in terms of information loading in cell firing rate [24] [25].

Represented by a simplified circuit diagram when two magnetoreceptor cells become a group of neuronal populations similar to two coils.

Magnetization currents are generated when charges form a buildup at the end of a magnetoreceptor cell in one of the magnetoreceptor fields in vivo. When the magnetization current reaches well above the threshold, the magnetoreceptor field can also form a transmembrane potential on copper proteins. Of course it is not excluded that calcium ions ca^{-2} are also involved.

The initial expression of seismic precursor signals in human magnetoreceptor cells can be described by a particle swarm algorithm that simulates a flock of birds capturing food. According to the wave-particle duality characteristic of particles, each seismic precursor signal (LFSE) entropy wave starts entering the input layer of the human body not as a complete waveform, similar to the particle swarm algorithm in which the smartest bird (=a quantum containing the seismic precursor signal) captures food, which has the shortest distance to a certain magnetoreceptor cell (=food) in the human body. Or in other words, a certain magnetoreceptor cell is the most sensitive under certain conditions, so that (LFSE) entropy waves a quantum rapidly into a specific function of the human body. With quantum entanglement, the relationship between other quanta with seismic precursor signals and the first quantum to enter the human body is like the relationship between other birds and the first bird that finds food, with the flock gradually flocking together to share the food found by the first bird [26].

Alfvén solitary waves, *i.e.*, nonlinear, penetrate intermediate media such as surface structures and oceans with little loss of ability to be propelled by solitary waves after formation. After non-invasive reception of Alfvén solitary waves penetrating the human body surface, the spiking waveform characteristics of neurons containing seismic precursor signals induced by such Alfvén solitary waves may be encoded by the joint participation of interneuron cells and spinal nerves.Obermayer *et al.* 1990 have shown that large networks of spiking neurons with separate populations of excitatory and inhibitory neurons can produce smooth sensory input maps [27]. Theoretically, the task of decoding seismic precursors is handled in specific small modules of the brain when a large network of spiny-wave neurons constructed from the magnetoreceptor fields of the body's peripheral nerves and spinal cord interneurons can penetrate the body with extrinsic (LFSE) entropy waves of the nervous system and induce corresponding neural flow patterns containing information about seismic precursors into the thalamus.

According to biocomputational mathematical studies, signals input to the brain from the outside world are first generated by the magnetoreceptor cells of the human senses to produce neural stream shapes, which are then transmitted along the interneurons and spinal nerves to the synapses of the brain. After decoding by the brain, the neural stream shape topographies can be downscaled to three-dimensional or two-dimensional Cartesian coordinate space [28].

The magnetoreceptor cells and the interneuron system of the human body are closely connected, and when the initial seismic precursor electromagnetic signal enters the body, the (LFSE) entropy wave generates a seismic signal that is not a real value but a matrix of vector sets approximating probabilistic wave functions containing entropy values at numerous multiple points obeying the thermal statistical law. For human-specific functions engaged in long-term earthquake prediction, intermediate and spinal neuron cells can automatically assign different weights and inductive bias values to the input information with the involvement of Bayesian inference in the brain.

Initially, there are an infinite number of trajectories of neural streams containing information about earthquake precursors. If the number of entropy wave signals denoted by N for seismic precursors is extremely large, by the time a large number of (LFSE) entropy wave signals are passed to the intermediate neuron system, the (LFSE) entropy wave has been downscaled to N-1 for the recurrent neural network performing this task and decomposed into bioelectric signals consisting of nonlinear waveforms of positive and negative ions. The human nervous system has the ability at the implicit layer to convert the neural flow patterns at the input layer into several bioelectrical signals with given weights and biases, greatly reducing the number of uncertain signals. The human brain, on the other hand, receives the neuronal spike pulse signals activated and weighted and biased by the neuronal system, which not only automatically completes the Fourier transform-like conversion of the time domain signal to the frequency domain signal, but also has the ability to iterate over the frequency signal. The human neuronal system has long been concerned with earthquake precursors and stores a large number of parameters of amplitude and spike patterns of earthquake precursors, and even magneto-thermal sensitivity, in the hippocampal region of the brain. Whenever the body's magnetic sensing system senses a new seismic precursor signal coming into the brain, the thalamus and prefrontal lobes apply a Kalman filter-like method to exclude "noise" unrelated to the precursor and match the decoded neuronal spike waveforms to the seismic region of interest to determine the final earthquake prediction.

The above is just the general process of encoding and decoding of earthquake precursor signals by human biological nerves. However, in earthquake prediction, the most difficult and critical of the three elements of prediction is how to determine the location of the epicenter. Even if seismologists have advanced and sophisticated modern scientific instruments, to achieve an accurate epicenter location, at least three or more base stations are needed to form the coordinate values of three intersecting circles on a computer system using transmitting and receiving equipment to finally locate the earthquake effectively in the first place after it occurs. The complexity of other radar and satellite positioning principles goes without saying. According to Ada's own claim, he does not have the function of displaying images in his brain that an earthquake will occur in a certain area. How then did he independently accomplish the processing of locating the epicenter differently from modern seismographs? This is indeed a mystery of natural science, no less complex than the maze of migratory birds that neuroscientists have long been studying to navigate themselves through thousands of miles of migration.

It has been mentioned earlier that there is a complete gap in the research on earthquake precursor signals and human specificity. In order to explain how human idiosyncrasies perform epicenter localization, this paper ventures to hypothesize that the human neuronal system with ultrasensitive magnetoreception may also have the following three special cells.

1) Magnetic baseline cells: the human body has long lived in the same latitude and longitude geographical area, the human body's biomagnetic field will naturally adapt to the magnetic field of the region in which it is located. When the local magnetic field is often disturbed by the Alvin solitary wave oscillation, the geomagnetic field instantly undergoes a brief change, when the body's magnetic

receptor cells of iron ions paramagnetic response immediately, which is the same reason as the general public long-distance car and boat rides are prone to drowsiness.

2) Magnetic inclination cells: Assuming that the magnetic inclination cells of the natural biological compass also exist in human neurons, the angle formed between the peak of the (LFSN) entropy wave acting on the neuronal spike waveform and the magnetic baseline cells Note: (The magnetic baseline is equivalent to the horizontal coordinate X at this point) can be calculated automatically.

3) Arithmetic neuron clusters. According to brain science, the brain has a different fuzzy algorithm than computing binary, although we do not yet know its algorithmic process, however, from the fact that the human brain has a matrix of more than 100 billion neuronal cells that can form tens of billions of orders of magnitude of neural synapses and networks, the contents of the human brain are addressable distributed memories, so the human nervous system is like a neural grid of tens of billions of units, and each specific neural spike pattern generates an Alfvén wave that can be readily recalled to a specific neural grid by a block matrix memory. From the superiority of the computational process of the human brain over deep learning machine algorithms, it is possible that there are special nonlinear arithmetic neural cell populations in the human brain.

As we all know, in the background of today's supercomputers so advanced, scientists are difficult to calculate the optimal solution of nonlinear isolated wave partial differential equations. As for the human brain, if the bruteforce algorithm, fullforce algorithm, and genetic algorithm, which imitate animal neural networks, are originally special algorithms for the function of human neuronal systems, they possess more advantages than those built on linear thinking machines [29]. Then when the human brain processes entropy waves far slower than the speed of light (LFSE), it possesses more advantages than those built on linear thinking machine possesses more advantages than algorithms built on a linear thinking machine.

Taking the genetic algorithm as an example, the coordinates of the epicenter that has occurred and the corresponding human nervous system sites are first encoded in the human brain, which can generate an uncountable number of possible epicenter ranges in the original memory of the global seismic zone map when the earthquake precursor signal is generated. However, the adaptive function in the human brain will try to find the local optimal solution, and the special magnetic sense of the human body and the brain work together to determine the epicenter location with the highest probability among the countless epicenter ranges using Bayesian cognitive memory, which is equivalent to finding the global optimal solution of a genetic algorithm.

With hundreds of billions of neurons, the human brain is as complex as the universe, and science has many harsh ethical constraints on human experimentation, research in brain science is still in the developmental exploration stage, and the neuroscience theoretical community acknowledges that the current understanding of the complex functions of the human brain is still limited. For the purpose of throwing light on the subject, this paper only attempts to give a simplified model of the brain to determine exocentric localization.

Modern neurobiology has established that the brain has directional cells [30], so when human magnetoreceptor cells sense seismic precursor signals and transmit them to the brain, it is possible that seismic precursor signal (SLFE) waves are preferentially encoded and processed as approximate directions from different seismic zones.

As shown in **Figure 1**.

For the brain, the brain's task of computing epicentral localization is greatly simplified when the shape of the neural stream has been recursively transformed and downgraded from the input layer to a frequency orthogonal map in the implicit layer [30].

To simplify the analysis, it is assumed that in the human brain, the Earth resembles a circle projected on a right-angle coordinate system in the frontal lobe of the brain. To calculate the decoded and reduced values of a (LFSE) entropy wave in a low-dimensional coordinate system within the brain, we first set the equator equal to the center of the circle at X0, when the human brain receives neuronal spike action potentials transmitted to the thalamus from different magnetoreceptive field synapses in vivo. The prefrontal lobe first starts to locate the range of epicenters where earthquakes may occur, and it is then necessary to determine the frequency direct map of the neuronal spikes characterizing the (LFSE) entropy wave at the coordinates (x_2, y_2), note. The coordinate values here are not real numbers, but tensor spaces of multi-vector combinations, which we simply replace with points to simplify the analysis.

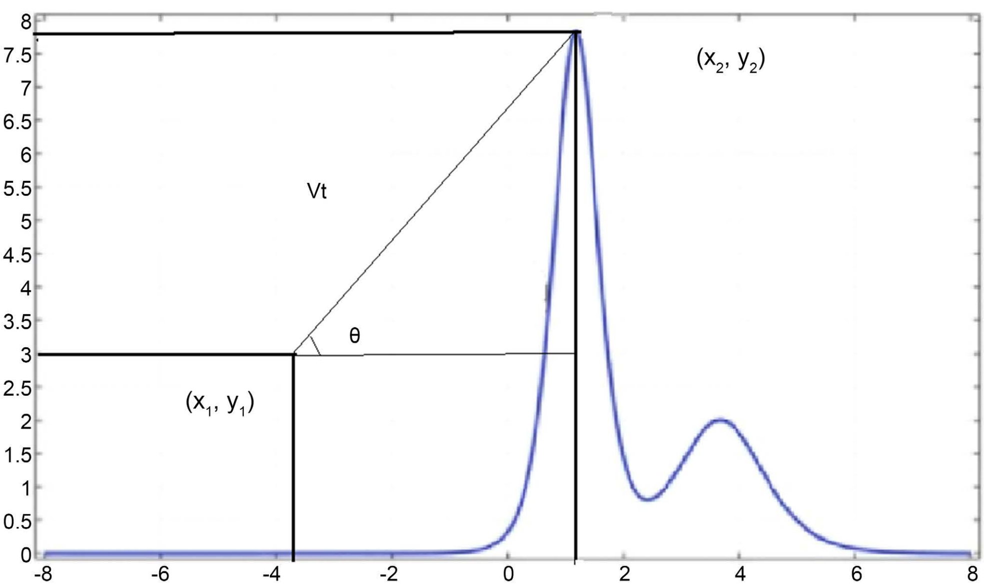

Figure 1. Transform the Cartesian two-dimensional coordinates and calculate the relationship between the peak of Alpine wave and the epicenter distance.

In the case of Ada, his region is Fuzhou, China, with latitude and longitude N26, E118, such that the Cartesian coordinates in Ada's brain are $(x_1, y_1) = (26, 118)$. The first strong Indonesian earthquake in which the epicenter described in the first part of this paper was positioned by Ada's body was a watershed event because it corresponded to the historic event of Wheatstone and Cook, the first scientists to invent the telegraph, receiving the sound of the call from both ends of the telegraph.

From a signal processing perspective, when the Indonesian earthquake precursor signal forms a memory in the ferritin ion channel in Ada's body, it is metaphorically equivalent to the body's magnetoreceptor cells directly laying a fiber optic cable that encodes a specific telephone area code for the earthquake precursor signal from Indonesia. This not only makes the body's magnetoreceptor cells aware that all future signals from this "area code + number" belong to the Indonesian earthquake precursor, but also has a clear exclusivity. This means that the spike patterns of neurons in magnetoreceptor fields in other parts of the body can no longer be the same as the spike patterns of neurons that already encode the characteristics of the Indonesian earthquake precursors. Therefore, the neuronal spike patterns that memorize the Indonesian earthquake precursor signal become an important reference system for the brain to process specific submodules of the earthquake precursor signal. With a finite Bayesian prior probability, the human brain can match the neuronal spike pulse sequences of different magnetoreceptor fields in the human body in a short period of time and correspond to the epicenter range of the corresponding geographic region.

Neuroscientific studies of sensory signal transmission to the brain have shown that the signals transmitted by the body's sensory system are crossed, with sensory signals from the left side of the body firing to the right hemisphere of the brain and vice versa.

The right half of Ada's body senses most of the earthquake precursor signals in the eastern hemisphere, and the left half senses the earthquake precursor signals in the western hemisphere. The upper body senses most of the earthquake precursor signals in the northern hemisphere, and the lower body senses most of the earthquake precursor signals in the southern hemisphere, including the different epicenter ranges distributed in front and behind the body. Of course, this distinction is not absolute because the left and right cerebral cortex is connected by large fibers of the corpus callosum, and the signals transmitted from the magnetoreceptor fields to the thalamus must be zoned and homogeneous.

An analysis of Ada's earthquake prediction record for 2011-2022, cite (**Supplements 1-3**) shows that in the first years, Ada had only a vague approximation of the location of upcoming epicenters; for example, Japan is about 3500 km long from north to south, and Ada's initial epicenter locations for Japan could only be matched to the country's name, but in recent years, he has been able to more clearly distinguish between Japan Hokkaido and Honshu, with epicenters such as Fukushima and Iwo Jima. This is also confirmed by Ada's increasingly accurate earthquake predictions for Indonesia and China's Sichuan and Yunnan in 2021-2022, suggesting that the human-specific nervous system can make progress in similar deep learning neural network algorithms to extend more fine-grained epicenter localization capabilities and even give direct latitude-longitude epicenter localization capabilities for certain areas where earthquakes will occur.

Another important point from Mbaden Babich's research on ferritin is that the highly loaded ferric ion channels in human nerve cells do not only generate magnetically induced currents. It also activates the magneto-thermal effect of ferritin on thermosensitive ion channels, producing an overall temperature rise in large areas of human peripheral nerves over a longer period of time. This is also quite consistent with the biological sensations felt by Ada for shallow earthquakes and earthquake precursors very close to where they live.

Given the physico-chemical anisotropy within the global seismic plate, each (LFSE) entropy wave from different seismic zone regions not only forms a different waveform, but also produces a very different (LFSE) wave peak. At the same time, (LFSE) entropy waves follow the Doppler effect, and the farther the distance from the seismograph, the longer the propagation time of the precursor signal of an impending earthquake, and vice versa. Therefore, there must be different microsecond time differences when the (LFSE) entropy wave is transmitted from the first layer of magnetoreceptor cells to the second layer of neuronal system, generating bioelectric signals in different regions of the body. According to modern neurobiological research, a very precise molecular clock exists in human cells; therefore, the human body-specific function of Ada can calculate the time difference between the seismic electromagnetic signal at different distances entering the body and the bioelectric signal based on the rate of change of distances in different geographic seismic zones and the speed of Doppler shift measurements. Under that, Bayesian calculations are performed on the frontal lobe of the brain, so that the Bayesian posterior probability is used to calculate the average propagation velocity V of the (LFSE) entropy wave, which is equivalent to solving the P-value of the Bayesian function. For seismologists, the longer the observed earthquake time series, the higher the accuracy of the velocity measurement of (LFSE) entropy waves.

According to neuroscience studies on neuronal spike sorting, the brain is divided into several small modules corresponding to the seismic precursors of peripheral nerve input signals, neurotransmitters transmitting signals from the central nervous system to the cerebral thalamus, stratifying, clustering and differentiating the final localization.

When the transmission velocity V of the entropy wave is essentially timed, the distance is a function of time t. That is, in trigonometry, it is possible for the human magnetoreceptive neuron system to also calculate the linear distance between its own region and the epicenter of an impending earthquake using Bayesian inference plus Solomonoff's infinite enumeration method [31], provided that two conditions are known.

Assuming the use of the ultra-sensitive magnetoreceptive nervous system of the human body, there are two computational methods for epicenter localization.

The first way: When the body's magnetic sensing cells receive the (LFSE) wave, the magnetic inclination cells are converted into action potentials of neuronal spikes with the (LFSE) wave, causing a response and calculating the magnetic inclination angle θ. The brain converts the X_2 - X_0 coordinate value into the Y axis, forming a new coordinate X_2, and the rest is the distance from the oblique side of $Y_1 \rightarrow Y_2$ sought by the brain. According to the trigonometric function, the sine or cosine angle is known, and the distance is easily calculated using the polar coordinate cosine formula.

The second way: The average velocity Vt of the (LFSE) entropy wave is calculated from the Bayesian prior probability of the brain, and the time t is set as a function of distance ($L = Y_1 \rightarrow Y_2$). When the molecular clock in the nerve cell is accurately estimated from the time difference of the precursor signals of different seismic zones, *i.e.*, the value of t is known, the distance formula of two points and one line can also be calculated using the hook and line theorem.

As shown in **Figure 1**.

The distance coordinates (X_2, Y_2) are known to determine the range of the epicenter, and the human brain can find the best (LFSE) isolated wave trajectory point by using the prior probability of Bayesian function statistics, after repeated iterative error correction, together with the filtering noise similar to the Kalman filter principle, and the approximate range of the epicenter can be calculated, and the latitude and longitude of the epicenter can also be calculated under certain conditions.

The nonlinear Alfven solitary wave is not a sinusoidal wave, there exists a more complex waveform, and the amplitude of each fluctuation of the Alfven waveform is approximately equivalent to the amplitude of different levels of earthquakes.

The waveforms of the nonlinear Alfven solitary wave in **Figure 1** can actually be distinguished as:

1) the small spike at the beginning of the solitary wave, 2) the top of the solitary wave spike, and 3) the tail wave spike after the solitary wave decays.

This could explain the ability of Ada's body to accurately sense the magnitude of earthquake tremors. We pointed out earlier that under the non-invasive action of the Alfvén solitary wave, a response is generated on a set of magnetoreceptor cells in the peripheral nerves of the body, and the neuronal cells can present a neural streamline that maps the characteristics of the encoded Alfvén waveform. The top of the Alfven spike corresponds to the maximum magnitude of the impending earthquake, while the waveform of the trailing spike after the decay of the earthquake energy can be considered as an aftershock signal of smaller magnitude, thus explaining how Ada can use Bayesian functions to predict the magnitude of an earthquake This is fully consistent with the principle of Occam's razor—simplicity is beauty. With the spike sorting records of neurons of different magnitudes recorded naturally by Ada's perisomatic nerves, the brain can infer an approximate equivalence formula between nerve cell firing rate intensity and earthquake magnitude based on the statistics of several Bayesian posterior probabilities. The result of perennial attention to human magnetoreceptor cells and corresponding brain regions for seismic precursor signals allows the neuronal system to establish high firing rate responses only to seismic precursor signals. Analysis of the ADA earthquake prediction records for 2011-2022 indicates a decrease in the accuracy of ADA magnitude prediction for strong earthquakes of magnitude 6.5 or greater in 2021-2022 (**Supplements 1-3**).

This is mainly due to the following reasons.

First, Ada rarely predicted earthquakes of magnitude 5 or less before 2019, it seems that his body's supernormal capabilities naturally filtered the interference of small earthquake signals, however, since participating in the AETA earthquake prediction contest in Shenzhen, China, according to the contest rules participants must predict earthquakes of magnitude ma3.5 or higher in Yunnan-Sichuan, so his body's magnetic sensing cells began to be more sensitive under the high concentration of brain training, and frequent sensing of small earthquake signals. This is also evident from the earthquake forecasts that Ada released in the media in 2021. **Supplements 1-3** is based on the neurogeometry of Bayesian computation, where the curvature of the signal trajectory from external inputs is related to the prior distribution encoded by each neuron. When small earthquake signals frequently stimulate dopamine secretion in the brain of earthquake detectors, it is easy to develop a priori magnitude thresholds and to reduce brain function for predicting the magnitude of strong earthquakes.

Second, from the perspective of signal processing science, earthquake forecasters do not rely 100% on the neuro-bioelectric signals evoked by the human nervous system when predicting the magnitude of an earthquake. This is because no matter how complex the image of the neural rheostat is and how large the amplitude is, the spike limit of the brain action potential is only 500, and the brain's recognition of complex neural rheological patterns is reduced and simplified to two-dimensional patterns for processing. Despite Ada's physical idiosyncrasies and extensive experience with Bayesian reasoning, there is still about 30% subjective consciousness involved in the judgment.

Therefore, it is normal to rely on human idiosyncrasies to predict the magnitude of an earthquake, with occasional deviations of 20% from the actual magnitude. After all, a natural person has many other troublesome distracting chores in society, and with high nerve tension and many distracting factors, the brain's intuition and judgment can rapidly decline. In outdoor environments with extremely high and low temperatures, human magnetoreceptor cells are greatly affected by temperature differences and the robustness of peripheral neural sensing (LFSE) waves is reduced, which also largely affects the accuracy of earthquake forecasting.

3. Conclusions

First, in this paper, the electromagnetic signal generated before an earthquake observed by human induction prediction earthquake explorer Ada for twenty years is matched with the characteristics of Alfven solitary wave, and it is proposed for the first time that Alfven solitary wave may be a fairly reliable earthquake precursor. This is certainly not an observable fait accompli by the standards of measuring scientific conclusions, but requires verification by leading astrophysicists and seismologists worldwide using more advanced astronomical instruments to observe the Alfvén wave generation process in the seismic zone. The complexity and enormity of this task is far beyond the independent research capability of the authors of this paper, so this paper is only a theoretical hypothesis of a new critical trigger mechanism for earthquakes.

In seismological research, anomalous animal responses and earthquake precursors have been found to be related for a long time, but have not been recognized by most seismologists. Personally, I think this is mainly because it is difficult for researchers to filter what is "noise" in animal responses and what is the real seismic precursor response. Although the authors have only studied one case of a statistical record of 20 years of earthquake prediction in Ada, there is more than one person in China who can sense earthquake precursors. The advantage of studying human sensing of earthquake precursors is that scholars can more easily communicate and empirically prove the phenomenon of human sensing of earthquake precursors.

The study of the human body's ability to sense earthquake precursors is only a means to an end, with the ultimate goal of developing earthquake prediction instruments that emulate advanced biological capabilities. If the idiosyncratic ability of the human body to sense earthquake precursors can be correctly explained by neuroscientists, although it took biological scientists nearly a century to come close to deciphering the biological navigation ability of migrating birds, and the complexity of the human brain does not know how many orders of magnitude higher than the magnetoreceptor cells of animals, from the theory to the development of earthquake prediction instruments, it may still require the first-class results of human frontier technology in the coming decades Accumulation and efforts, however, the rapid development of AI in the twenty-first century has already allowed us to see the dawn of the future prevention of large earthquakes to bring human suffering.

Acknowledgements

Editor-in-Chief of ScienceOpen Research: Prof Dr. Alexander Grossmann approved my article to be published in the preprint of ScienceOpen Research, so that made me confident to continuously revise this article. Sincere thanks to the Sina Weibo China WeChat group of followers for their generous sponsorship of this research! Thanks also to I also thank the anonymous reviewers of the Open Journal of Earthquake Research (OJER) I would also like to thank the anonymous reviewers of Open Journal of Earthquake Research (OJER) for their valuable suggestions and the editors for their efficient work.

This article has been independently completed by the corresponding author Cao Da, and I have confirmed it.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Cite (Annex) Supplementary Material

Supplement-1. Raw screenshot data of earthquake predictions from 2011-2022 http://www.dizhentan.com/thread-8997-1-45.html.

Supplement-2, Statistical Validation Form II. 2011-2022 Excel Earthquake Forecast Statistics.

Supplement-3, EQL photo and media coverage website. Note: Data and resources for the supplemental materials are publicly available on both the Open Science website and the Figs website https://figshare.com/account/items/24590730/edit.