

# Stellar Transformer Concepts: Solar Induction Driver of Natural Disasters Forecasting with Geophysical Intelligence

Bruce Leybourne – Research Director  
Institute for Advance Studies on Climate Change (IASCC)  
Aurora, CO 80014/MT, USA [www.iascc.org](http://www.iascc.org)  
Sponsored by: *Climate-Stat Inc.* [www.climatestat.com](http://www.climatestat.com)

## ABSTRACT

Understanding how *Stellar Transformer Induction* concepts explain *Space Weather* and *Cosmic Ray* links to our *Solar System Endogenous Energy*, *Magnetic Moment*, and *Plasma Core Planetary Electronics* with *Geophysical Intelligence* has become paramount for understanding what drives most *Natural Disasters* on planet Earth. The science works toward unified solutions within an *Electric Universe* paradigm. Interdisciplinary efforts in unraveling these relationships should become a national priority as part of our “*Space Force*” development. In addition a myriad of interrelated *Natural Disaster Forecasting* is likely possible with *Gravity Magnetic Modeling*, and mapping of *Lightning* and *Earthquake* activated *Mantle Circuits* with new methodologies under development. With these new technologies increased accuracies are expected in forecasting of severe weather outbreak such as, *Hurricanes*, *Tornadoes*, tectonic activity such as, *Earthquakes*, *Volcanoes*, and certain types of *Wildfire* outbreak related to solar activity such as *Coronal Mass Ejections*, *Solar Flares* and *Space Weather* fluctuations tied to *Cosmic Ray* inputs. As well as internal affects linked to *Axial-Radial Solar Induction*. *Climate Change* is just part of this puzzle, historical significance of *Electro-Magnetic Pulse* (EMP) impacts in the past are likely to become realized as a dominant control on the geologic and tectonic history of earth and larger functions occurring at the *Solar System* level.

**Keywords:** *Stellar Transformer Induction, Space Weather, Cosmic Ray, Solar System, Endogenous Energy, Plasma Core Planetary Electronics, Geophysical Intelligence, Electric Universe, Space Force, Natural Disaster Forecasting, Gravity, Magnetic Dipole Moment, Modeling, Lightning, Earthquake, Mantle Circuits, Hurricanes, Tornadoes, Volcanoes, Wildfire, Coronal Mass Ejections, Solar Flares, Axial-Radial Solar Induction, Climate Change, Electro-Magnetic Pulse.*

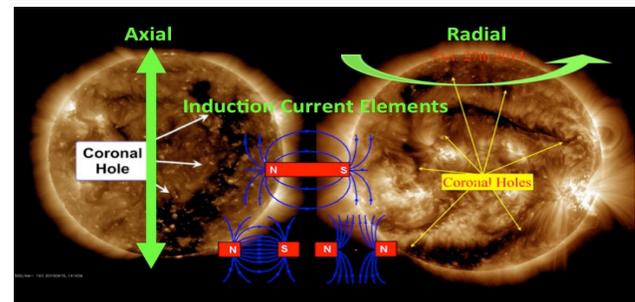
## 1. INTRODUCTION TO A STELLAR TRANSFORMER

*Electro-Magnetic* or *Magnetic* induction is the production of an electromotive force, or voltage, across an electrical conductor in a changing *Magnetic* field. The *Stellar Transformer Concept* [1] contends that simple step down energy induction occurs between sun and earth, much like the transformer process that steps down your household energy from higher voltage transmission lines sourced from the power company. The sun would represent a large coil from the power company, while the earth represents the smaller coil to your home. The larger coil element generally excites current into the smaller coil element by induction of step energy down. Layers within the Earth hold and release charge acting as condensers, or capacitance layers. Thus the larger *Stellar Transformer*

*hypothesis concludes that induction characteristics are determined by the Earth's Magnetic Moment* (See: Section 4) representing the *Magnetic strength* and orientation that produces *Magnetic field current alignments* between layers in the Earth and polarity and field strength relationships or *Magnetic Moment* between of the Earth, Sun and other planets. The alignment and polarity determine the attraction or repulsive forces in plasma physics and determine charging and discharging forces on our planet. The implications to humanity are that *Stellar Transformer* concepts can be implemented with an improved understanding of common *Electro-Magnetic* denominators associated with *Space Weather* hazards such as; *Electro-Magnetic Pulse* (EMP), communications, general every day and extreme weather events, i.e. *Hurricanes*, *Tornadoes* associated with the variable frequencies of *Climate Change*, *Earthquakes*, *Volcanoes*, and certain types of wildfire outbreaks associated with *Coronal Mass Ejections* (CME's). For this purpose, development of data visualization tools to extract and add *Geophysical Intelligence* from a multitude of environmental data is valuable for forecasting *Natural Disaster* events of many types.

## 2. SOLAR INDUCTION

Solar coronal holes that are aligned with the sun's north-south axis are considered *Axial Induction* elements, while those aligned with the equator are considered *Radial Induction* elements. Most coronal holes configurations represent some combination of the *Axial* and *Radial* elements. This is important to understand because the elements on earth are directly energized by alignment relationships between these sun and earth elements controlled by *Magnetic Moment* orbital physics. These dark coronal holes on the sun represent the induction current elements of our *Solar Stellar Transformer* (Fig. 1),

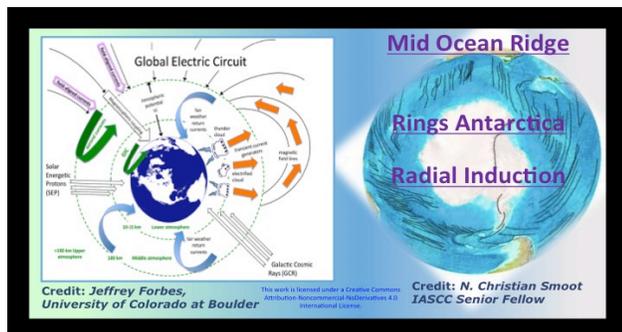


**Fig. 1. SOLAR STELLAR TRANSFORMER INDUCTION CURRENT ELEMENTS** Coronal holes express induction elements in axial vs. radial orientations determining axial vs. radial affects on Earth systems. Polarity determines attractive/repulsive force determining charging/discharging relationships [2].

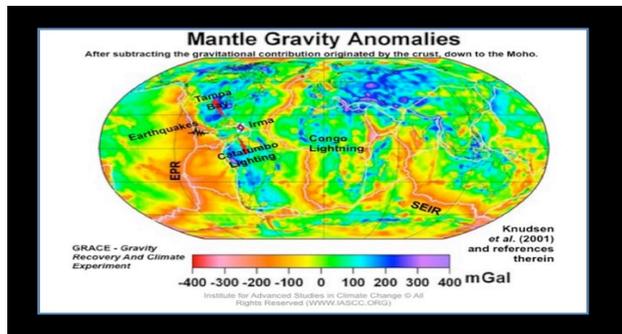
charging/discharging the sun from elements within the arm of our spiral galaxy and thereby the *Solar System* including Earth, via *Electro-Magnetic* wavelength and frequency response, within an *Electric Universe* framework [3].

### 3. AFFECTS ON EARTH

In space above the earth's poles there are aurora plasma rings, inducing ground currents within the mid-ocean ridges, especially the mid-ocean ridge encircling the South Pole (*Radial Induction*) (Fig. 2). A direct coupling with the Earth's most powerful induction current elements occurs within its mantle and inner/outer core. Mantle circuit trends can be mapped with satellite mantle *Gravity* imaging of the thermal signatures given off by induction current elements of the mid-ocean ridge circuits (Fig. 3). Complex *Magnetic Modeling* techniques reveal multi-phase circuit configurations of the Polar Regions, reviewed in previous writings "*Evolution of Earth as a Stellar Transformer*" [1]. For example, circuit activation and switching of these global scale electric circuits mapped by satellite *Gravity* and *Magnetics* signatures can be understood in terms of shifting *Earthquake* and *Lightning* hotspot activity. The Southeast Indian Ridge mantle circuit provides South Pole grounding links to lightning activity in the African Congo. A more robust discussion follows (See: Section 6).



**Fig. 2. GLOBAL ELECTRIC CIRCUIT** Conventional Model includes Ground Inductions Currents (GIC) magnetically coupled to Aural Ring Currents torqued by Field Aligned Induction currents from magnetosphere coupling to solar forcing. (Forbes, J. - University of Colorado – Boulder). Step down aurora energy to the Mid-Ocean Ridges encircling Antarctica would generate powerful radial ground induction currents (Smoot, N.C. - Sr. Fellow IASCC).

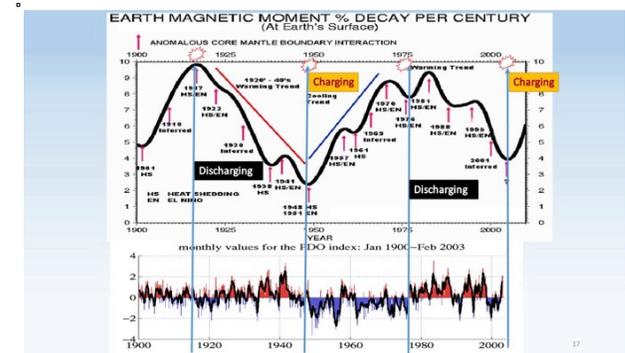


**Fig. 3. MANTLE GRAVITY ANOMALIES** from GRACE satellite mission data [4] indicate East Pacific Rise (EPR) polar and continental circuit connections to Catatumbo, Tampa Bay *Lightning* anomalies, and Southeast Indian Rise (SEIR) connections to the African Rift/Congo global lighting anomalies.

A global momentum shift in *Lightning* from the African Congo to Lake Maracaibo, Venezuela occurs in conjunction with the 11 year sunspot cycle and signals a change of Earth's charging phase, which switches to the East Pacific Rise. This is the Earth's largest ridge and a most active mantle circuit linked to *Earthquakes*, *Volcanic* activity and huge *Climate Change* [1]. An *Interdisciplinary Forecasting* approach using an innovative electro-dynamic model of our *Solar System* can be built with *Geophysical Intelligence*. This builds a comprehensive framework for understanding Earth's interactions with *Space Weather*.

### 4. ELECTRO-MAGNETIC COMPONENTS

The relationship to *Earthquakes*, *Lightning* and sunspot activity did not go unnoticed. The question remained... Why? One of our friends and a Sr. Fellow with *Institute for Advanced Studies in Climate Change (IASCC)*, John Quinn, developed the *World Magnetic Model* for the Navy to determine Earth's *Magnetic* field drift over time. Consulting with John was key in advancing the concept of an *Electro-Magnetic* climate driver linked to changes in solar magnetism. John Quinn not only introduced us to Gregori's *Earth Endogenous Energy* theory [5], he sent us a *Magnetic Moment* decay chart for the 19<sup>th</sup> century (Fig. 4 - modified) that we found showed direct correlations to El Niño Southern Oscillation (ENSO) and the warming (discharging) and cooling (charging) phases of the Pacific Decadal Oscillation (PDO). These climate oscillations are linked to solar *Magnetic* variations charging and discharging the *Plasma Core* of the *Stellar Transformer* in rhythm with the climate cycles (Fig. 4).



**Fig. 4. Magnetic Moment Decay** (Top - John Quinn [6]) & Pacific Decadal Oscillation (PDO) Climate Index (Bottom) are compared. Top figure reflects past century of Earth's *Magnetic* moment decay field changes. Large curve trends correspond to global warming and cooling trends reflected in the PDO the largest global temperature proxy. While smaller inflections are associated with El Niño Southern Oscillation (ENSO). Bottom figure shows PDO warming trends in red, cooling in blue moving in approximate 36-year rhythm with the *Magnetic* field changes. Peaks in decay values would represent minimum/maximum amount of torque on the dipole, which occurs when the dipole is at parallel/right angles, respectively, to the *Magnetic* field of the *Interplanetary Magnetic Field (IMF)*.

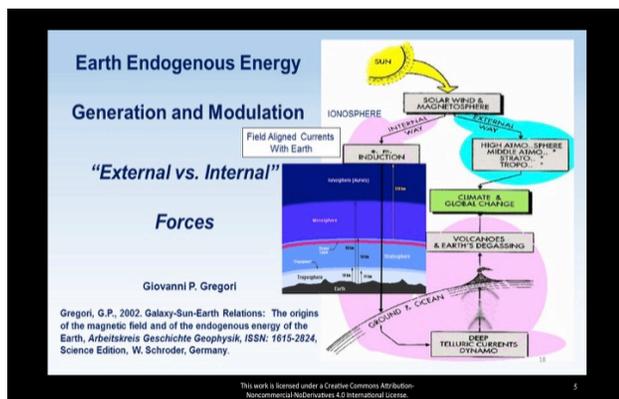
The *Magnetic Moment* is defined as a quantity that represents the *Magnetic* strength and orientation of a magnet or other object that produces a *Magnetic* field. The *Magnetic Dipole Moment* of an object is defined in terms of the torque the object experiences in a given *Magnetic* field. The strength and

direction of this torque depends not only on the magnitude of the *Magnetic Moment* but also on its orientation relative to the direction of the *Magnetic* field and is therefore considered a vector. The direction of the *Magnetic Moment* points from the South to North Pole within the magnet in this case the Earth. The magnetic field of a *Magnetic Dipole* is proportional to its *Magnetic Dipole Moment*. The dipole component of an object's magnetic field is symmetric about the direction of its *Magnetic Dipole Moment*, and decreases as the inverse cube of the distance from the object. The strength of a *Magnetic Dipole* is called the *Magnetic Dipole Moment*. Considered a measure of a dipole's ability to turn itself into alignment within a given external magnetic field. In a uniform magnetic field, the magnitude of the dipole moment is proportional to the maximum amount of torque on the dipole, which occurs when the dipole is at right angles to the magnetic field. The *Magnetic Dipole Moment*, often simply called the *Magnetic Moment*, may be defined then as the maximum amount of torque caused by magnetic force on a dipole that arises per unit value of surrounding magnetic field in vacuum (Wikipedia & Britannica).

### 5. PLANETARY PLASMA CORE ELECTRONICS

The Earth's climate is controlled by the Sun through both the "external" and "internal way" (Fig. 5). The "external way" is a chain of cause-and-effect, beginning from the Sun and its *Electro-Magnetic* and corpuscular radiation, through the Earth's many layers as sunlight and "Space Weather" [7].

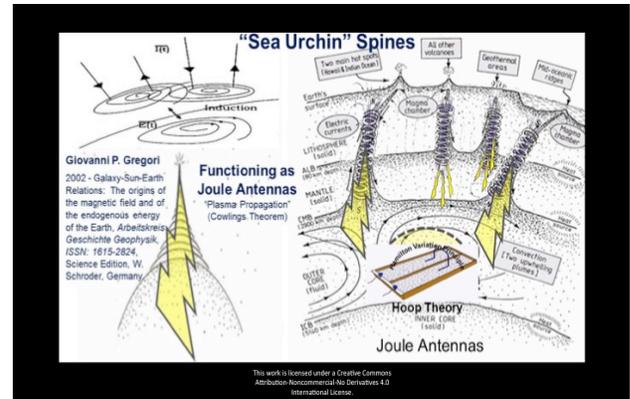
The "internal way" is rather a chain beginning from the *Solar Induction* through its long-period *Electro-Magnetic* wavelengths affecting inside deep Earth, which modulates the production of *Endogenous Energy*. Climate can be likened therefore to the ensemble of phenomena that occur inside a condenser during its discharge. The upper plate of the condenser would include solar wind and higher atmospheres, which is powered by electric current generator solar winds. The condenser lower plate is generally underground except on the outer boundary of volcanic plumes, and is powered by an electric potential generator a tidally driven geo-dynamo [7].



**Fig. 5. The "External" and "Internal Way" in solar-terrestrial relations [5].** Giovanni P. Gregori – Sr. Fellow IASCC

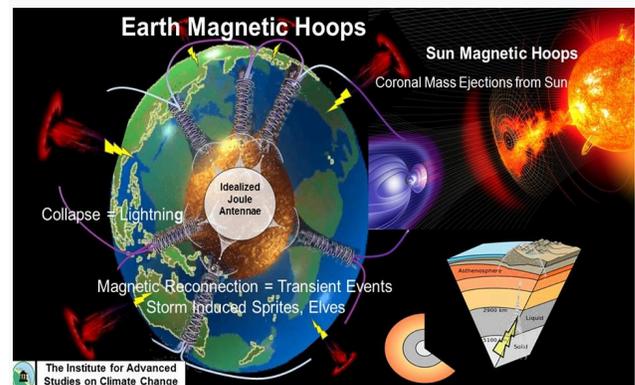
Using a model similar in nature to a "sea-urchin", Gregori explains the propagation of electrical "Joule" energy along these "sea urchin" spines (Fig. 6) to Earth's core and geologic hotspots around the globe. Joule energy in this sense means "electrical energy" at the termination point results in heating,

like a soldering iron or element, i.e. a "shorted circuit". The Sea-Urchin *Plasma Core* concept has now been confirmed with "Star in a Jar" developments like the Safire Project, <http://safireproject.com/>, which shows the development of plasma anode tufts in organized energy patterns as the Sea-Urchin model predicts. Repulsive forces in the anode tufts control their energy geometry. While the induction energy mechanism is the key to internal forcing [5, 7].



**Fig. 6. Earth "Internal" Sea Urchin Spike/Antenna Adding to conventional Earth Model the concept of electrical potential joule spikes emanating from a plasma core. [5].**

The induction characteristics are determined by current alignments between layers in the Earth and polarity relationships between of the Earth, Sun and other planets. The alignment and polarity determine the attraction or repulsive forces in *Plasma Core* physics and determine charging and discharging forces on our planet (Fig. 7, Idealized *Plasma Core Model of Earth as a Stellar Transformer*, See: <https://www.iascc.org/free-stuff>).



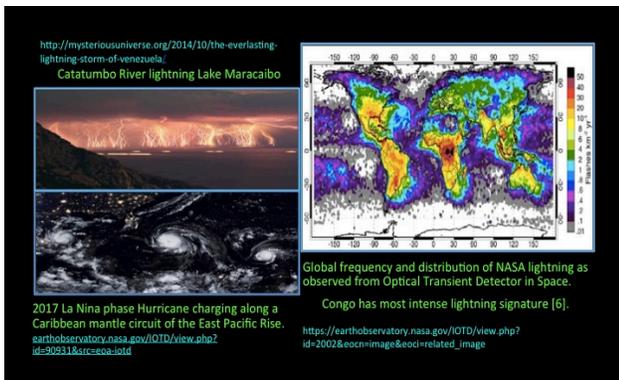
**Fig. 7. EARTH AS A STELLAR TRANSFORMER idealized Plasma Core Planetary Electronics based on Sea Urchin Spike Model (Gregori, 2002) as anodes tufts (Safire Project 2017 <http://safireproject.com/>) See: *Electric Universe 2015* Presentation <https://www.iascc.org/free-stuff>.**

For example, circuit activation and switching of these global scale electric circuits mapped by satellite *Gravity* and *Magnetic* signatures can be understood in terms of shifting *Earthquake* [7] and *Lightning* hotspot activity [8]. The Southeast Indian Ridge (SEIR) mantle circuit provides South Pole grounding links to lighting activity in the African Congo. *Lightning* geospatial patterns shift from the African Congo to Lake Maracaibo, Venezuela signaling a change of Earth's charging phase to circuits on the East Pacific Rise (EPR). This is the Earth's largest ridge and a most active mantle circuit linked to

*Earthquakes, Volcanic activity and huge Climate Change* [1]. Interestingly there is a diurnal, daily, affect too (See: Section 6).

## 6. RIDGE INDUCTION AFFECTS LIGHTNING TELLS THE STORY [8]

National Aeronautics and Space Administration (NASA) launched Optical Transient Detector (OTD) in 1995 to 2000, a prototype of the Lightning Imaging Sensor (LIS) instrument launched in 1997 to 2015. These were specifically designed to detect *Lightning* from space during both day and night with storm-scale resolution. Earth's *Lightning* hotspots were revealed with very high-resolution *Lightning* climatology derived from 16 years of space-based Lightning Imaging Sensor observations. Analysis and results published in 2016 [8] revealed, "Where are the lightning hotspots on Earth?" For years, African Congo (right - Fig. 8) was known as the *Lightning* Capital of the World, while the Tampa Bay, Florida area was unofficially known as the "*Lightning* Capital of the United States." Also sometimes called "*Lightning* Alley", but in 2016 with the new *Lightning* analysis [8], the *Lightning* hotspot location moved about 30 miles southeast of Fort Myers Florida, while Catatumbo *Lightning* (upper left - Fig. 8), became the new *Lightning* Capital of the World at Lake Maracaibo, on the coast of Venezuela. Or possibly the new data may have clarified that the hotspot location was originally in these locations, without prior years data to 1995 this is an unknown. Knowing precisely where the concentration of *Lightning* hotspot activity had shifted in Florida made it easy to take an educated guess that the turn of *Hurricane* Irma (and later *Hurricane* Philippe) would occur near Ft. Meyers... (Letter to NCGT Editor, 05 Sept. 2017 [9], Follow on paper with IMSCI [10]).



**Fig. 8. CATATUMBO LIGHTNING** (upper left image), and Intense African Congo *Lightning* from NASA (upper right image). Irma, Katia, Jose (lower left image) charging the Earth along a Caribbean mantle circuit. The African Congo *Lightning* flash global frequency and distribution of *Lightning* as observed from space by the Optical Transient Detector (upper right image) shows Congo with most intense *Lightning* signature [11].

What made the global *Lightning* distribution shift from Africa to South America [8]? And why was there a corresponding shift in Florida from Tampa Bay to Ft. Meyers, where *Hurricane* Irma made its turn? There seems to be a simple *Electro-Magnetic* attraction from *Solar Induction*, as the *Hurricane* must release its charge and will do so intensely at induction activated areas. Intense *Lightning* activity activates and/or signals the activation of lithospheric and *Mantle Circuits*. The *Hurricanes* track these circuits (Fig. 3, Fig. 8 lower left) when EM induction activity is

high, or when it's stirred by the solar winds as indicated by the high solar Kp 7 index during periods driven by Coronal Mass Ejection's (CME's). The turn of Irma at Ft. Meyers indicates the *Hurricane* switched from the Caribbean circuit to one that follows the Florida Peninsular Arch dropping in power till having an increased power discharge at Tampa Bay. The discharging levels seems directly related to intensity of the *Hurricanes*. Intuitively one might think the discharging decreases the *Hurricane* power, but it seems more related to increased power, i.e. increased vortex energy or wind speeds. The discharging *Hurricane* (atmosphere) is charging the Earth.

Further interpretation leads to some interesting ideas about how *Solar Induction* affects the inline vortex (with spin of the earth) ridges structures of our planet associated with the East Pacific Rise and northern component of the Southeast Indian Ridge "hot circuits" (See: Section 10) along with their corresponding equatorial collapsed vortex structures (perpendicular to spin of the earth) of the Caribbean and Lake Victoria near the Congo respectively. After all the Earth is a spinning vortex and does exhibit vortex expressions much like a *Hurricane* displays the inline (eye) and collapsed vortex structures (rain frontal system with heavy *Lightning*). These vortex analogy concepts are key to interpretation and fundamental understanding. These relationships are further explored in the inner and outer-core relationships as directly observed in polar aurora (See: Leybourne *Electric Universe 2016 "Geometry of Earth's Endogenous Energy"*

<https://www.youtube.com/watch?v=Q355Haapq-0>.

### Catatumbo – East Pacific Rise (EPR)

The excerpts about global lightning distribution, timing, and intensity in sections below are taken from lightning study in Albrecht et. al., 2016 [8]. Differing interpretations are those of the author.

Catatumbo is a river that ends southwest of Maracaibo Lake and the Catatumbo *Lightning* hotspot as well as nearby hotspots, except the one in Bolivia, have similar annual and diurnal cycles of *Lightning* activity with most *Lightning* occurring during the night. Nocturnal thunderstorms over Lake Maracaibo locally known as the "Lighthouse of Catatumbo," the "Never-Ending Storm of Catatumbo," are so frequent that their *Lightning* activity was used as a lighthouse by Caribbean navigators in colonial times (12). Most of the daytime *Lightning* occurs near the coast and is driven by a sea-breeze circulation. *Lightning* activity is only observed over a small area of the lake during the late afternoon when the East Pacific Rise is solar aligned for maximum induction at noon. While the upper northward extension of the South East Indian Ridge is aligned with midnight. The data shows that Lake Victoria as well as other lakes along the East African Rift Valley, exhibits increased *Lightning* with deep nocturnal convective activity during this same daily alignment. Thus we see a daily ridge induction affect drawing lightning into the South American and African rift lakes systems especially at midnight with a smaller affect at noon. This nocturnal convection is also associated with convergence of *Gravity* waves, which we hypothesize can be considered an induction affect, i.e. planetary scale waves. A physical mechanism coincident with this induction affect would be low frequency oscillations or vibrations of ridge structures encircling Antarctica and the northward extensions of the EPR and SEIR systems due to thermal expansion/contraction

episodes of joule heating from plasma impingement as increased *Lightning* inputs ground on these circuits. *Lightning* activity over Lake Maracaibo presents two peaks during the year, where most of the *Lightning* occurs from August to November, drastically decreasing in December with almost no *Lightning* in January and February. The second peak is in May and June. The strong diurnal cycle of *Lightning* frequency reveals almost no *Lightning* during the day and a nocturnal maximum from 0000 to 0500 LST abruptly peaking at 0300 LST (Local Standard Time). To reiterate, at 0300 LST in Catatumba the EPR is directly aligned with midnight!

#### North America – East Pacific Rise (EPR)

The top U.S. hotspot lies over the Everglades near Orangetree, Florida, about 37 km from Fort Meyers, precisely where *Hurricane* Irma hit. The top U.S. hotspot is ranked only 14th in North America. This same location coincides with that found in the first thunderstorm day climatology constructed by [13]. These authors compiled the number of thunderstorm days recorded by surface weather stations around the globe from 1951 to 1975 and found that Fort Meyers, Florida, is the place with the most thunderstorm days per year (96) in the United States, with a peak in July. Interestingly the data before 1970 shows the Florida hotspot in Ft. Meyers, and the data sometime after 2003 shows Ft. Meyers, but before 2003 many interpretations expressed that the Congo was considered the top global *Lightning* hotspot. Interpretation of Quinn's *Magnetic* moment decay curves (Fig. 4), shows the 1970 -2003 period as a discharging period linked to Pacific Decadal Oscillation (PDO) warm phase. Whether this is more due to polarity of the ridge induction switching mechanism or possibly a global change in net charge or discharge is still to be determined.

During the winter months when the South-Pole faces closer toward the Sun supplying more outer core energy transfer during an axial induction phase linked to coronal hole configurations, the Gulf of Mexico region has twice the number of *Lightning* flashes during El Niño years than non-El Niño years [14]). Moderate *Lightning* activity is also observed within the Gulf of Mexico (with a peak in winter/spring) and over the warm Gulf Stream at the Southeastern U.S. coast (summertime peak). Gulf of Mexico has strong connections to the East Pacific Rise via the Caribbean, but also has a strong influence from the Mississippi Rift connection to the Great Lakes vortex, and Appalachian trends to North Pole.

In North America, the first and second hotspots (respectively, Patalul and Catarina, in Guatemala) as well as the ninth hotspot (Rosamorada, Mexico) are also at the foothills of a mountain range, the Sierra Madre, which aligns closely with an hour or 2, offset east of East Pacific Rise. *Lightning* should start early afternoon 1-2pm in this very narrow low-level strip of land between the Pacific Ocean and the mountains. These hotspots do show an afternoon *Lightning* peak with most of the *Lightning* activity occurring during boreal spring and summer. All remaining North American hotspots are over the Central America islands (Cuba, Honduras, Haiti, and Jamaica) that also exhibit afternoon *Lightning* activity occurring mostly during spring and summer. Interestingly these areas are also prone to large *Earthquakes*.

#### Congo – South East Indian Ridge (SEIR)

Earth's second greatest *Lightning* hotspot is at Kahuzi-Biéga National Park northwest of Kabare in the Democratic Republic of the Congo near the border of Rwanda (on the west side of the Mitumba Mountains; Fig. 9). The Mitumba Mountains at the eastern edge of the Congo basin mark the beginning of the Western Rift Valley in East Africa, along a north-south orientation at ~29°E and with peaks ranging from 2,000 to 5,200 m. Greater *Lightning* flash rate densities are observed along a continuous large area on the western foothills of these mountains from 4°S to 5°N, having 6 out of the 10 African hotspots. Ba and Nicholson in 1998 [15] found that maximum convection occurs during the morning (0500-0800 LST). Interestingly this is the period the Mid-Atlantic Ridge goes through midnight, about the same time the Western Pacific Rim aligns with noon and the South Pole offset toward Australia. A very powerful tectonic vortex alignment, with Lake Baikal, Banda Sea, and the Australian Antarctic Discordance (AAD) south of Australia all lined up with offset of South Pole tilt toward Australia directly south of AAD. A second peak in the afternoon is over the surrounding lands (not lakes) with maximum convection is observed in the afternoon and evening. These findings are corroborated by the daytime and nighttime Flash Rate Density over Lake Victoria. Other African Rift Valley lakes such as Tanganyika, Malawi, and Albert show nocturnal *Lightning* activity peaks during the late night and early morning. *Lightning* hotspots over the Mitumba Mountains exhibit higher mean diurnal cycle flash rates during the afternoon from 1500 to 1700 LST than in the central Congo at 1500 LST, with some activity during the night. The 1500 afternoon local time 3 hour offset from noon suggests Induction from Northward component of the SEIR in the Indian Ocean. The Rodriguez Triple Junction tectonic vortex is 3 time zones to the East of the African continental rift. This north-south trend of the SEIR also directly aligns with the Pakistan *Lightning* area at the head of the Indus River. Large river systems are tied to many of these grounding zones. Thus the main induction element to monitor for Africa is the northern component of the SEIR.

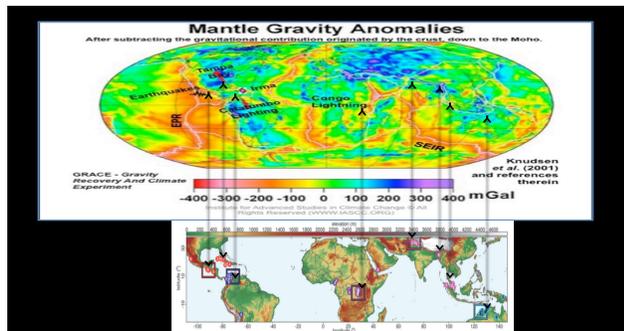
Lake Victoria (as well as other lakes along the East African Rift Valley) also exhibits deep nocturnal convective activity likely from a direct induction affect from African Rift alignment at midnight. Thunderstorms occur year-round in central and western Africa, but these regions are electrically more active from September to May during the northern hemisphere wintertime, when South Pole faces sun and SEIR has more induction affect. Less *Lightning* activity is observed in July when North Pole faces sun.

#### Asia – South East Indian Ridge (SEIR)

The Indian subcontinent as a whole has a *Lightning* maximum during the pre-monsoon season and a secondary peak in late August to October. This second peak is related to thunderstorms during the post-monsoon season in the central region. The diurnal cycle over most continental regions presents the *Lightning* maximum during the afternoon. The month of maximum flash rate density shows most *Lightning* occurrence during summer months, except for strong monsoonal regions, as with India and the Amazon where *Lightning* maximum activity occurs during springtime (pre-monsoon months) and in the case of India also in the post-monsoon months. Mostly likely mush

of this is normal solar thermally driven. At high elevations over the Tibetan Plateau, the local hour of maximum *Lightning* is during the day. Two types of orographic terrain control cloudiness in the Himalayan range [16]: the first type is associated with the major river valleys (~300 km wide) and the overall mountain range that connects India and the Tibetan Plateau, while the second type is associated with the succession of ridges and small valleys (5–150 km wide) along, nearly contiguous line within the Himalayan river valleys and the narrow valleys, respectively, in northern India and Nepal, with Malaysia and Sumatra Island (Indonesia) and are caused by a sea breeze resulting in the afternoon peak at 1500 LST. The Rodriguez triple junction along the North South component of SEIR is at noon when this area fires up.

High to very high nocturnal *Lightning* activity can be found at the high elevation envelope along the length of the Himalayas in Asia. Asia's top-ranked *Lightning* hotspot, Daggar, Pakistan, is located in the westernmost portion of the Himalayas foothills at the Indus' Plain, more specifically at the Hindu Kush range in the northernmost region of Pakistan. Three other Asian hotspots (the second, third, and fifth highest) are also located in this region, whereas the sixth Asian hotspot is at the most eastern portion of Himalayas, at the Kashi Hills (on the border between India and Bangladesh). The western Himalayas were also identified as a region with the most intense thunderstorms on Earth and found that the deepest intense convective storms occur upwind or at the foothills of the mountains, where the moist southwesterly monsoon flow from the Arabian Sea meets the descending dry air from the Afghan or Tibetan Plateaus, suggesting a similarity to dryline convection. All these hotspots have more *Lightning* activity during the monsoon months, May–October, peaking in September and less from November to March, with the most *Lightning* activity extending from late afternoon (1600 LST) to early morning (0600 LST), with the exception of the second- and third-ranked hotspots. The nocturnal *Lightning* is controlled by convection “induced by the interaction between the large-scale synoptic flow and the complex terrain”. The term “induced... synoptic flow...” is likely governed by the *Solar Induction* affects of these ridge systems and the inner/outer core affects.



**Fig. 9. LIGHTNING HOTSPOTS** (lower insert [8]), Relationships to Mantle Gravity Circuits (upper insert [4]). Although coastal relationships to *Lightning* exist in many instances, most if not all *Lightning* hotspots appear related to mantle circuit termination points associated with rift, rivers and lake systems within continents as well as nearby planetary scale vortex structures adjacent to circuits.

### Oceania – Western Pacific

Oceania *Lightning* hotspots all are found at the northern coast of

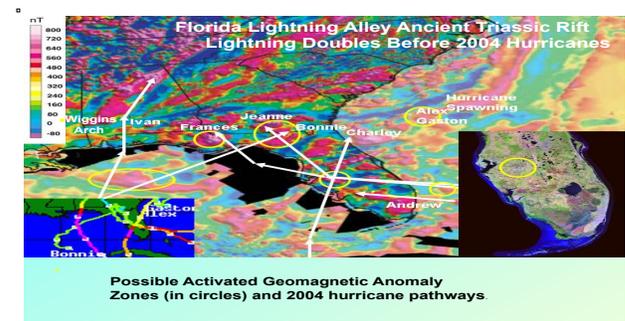
Australia, except the fifth most active locale that is found in Papua New Guinea. Most *Lightning* is attributable to local convection in the afternoon, mostly during austral summer monsoon with two peaks (December and mid-January to March).

During the night, convergent offshore breezes from the peninsular Malaysia and the Sumatra Island over the Strait of Malacca leads to increased *Lightning* over the ocean after midnight likely a direct affect from Banda Sea and South Polar alignment of Western Pacific circuit. Most of these *Lightning* hotspots are tied to the Caribbean, African and Indonesian huge planetary scale tectonic vortices.

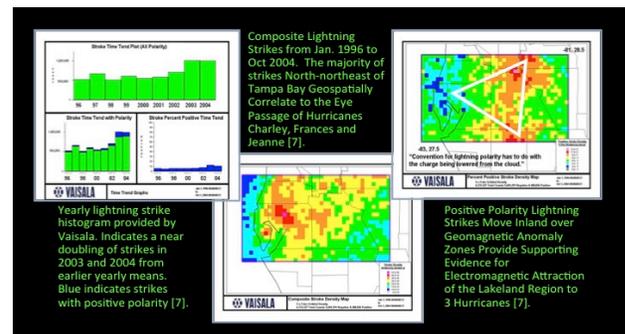
*The excerpts about global lightning distribution, timing, and intensity in sections above are taken from lightning study in Albrecht et. al., 2016 [8]. Differing interpretations are those of the author.*

### 7. TAMPA BAY LIGHTNING ANOMALY

In a 2005 research proposal on “*Florida Hurricane Shock from Lightning Activated Geomagnetic Anomalies*” we identified the overall problem with the following hypothesis: Multiple *Hurricane* tracks inundating Florida during the 2004 season may result from grounding of the global electric circuit along geomagnetic anomaly trends (Fig. 10).



**Fig. 10. HURRICANE TRACKS** Lightning Grounding Zones to Magnetic Anomalies along Ancient Triassic Rift trends in the lithosphere. (Magnetic Data USGS [17] modified). Wiggins Arch stretches from Mobile Bay to Wiggins, Mississippi.



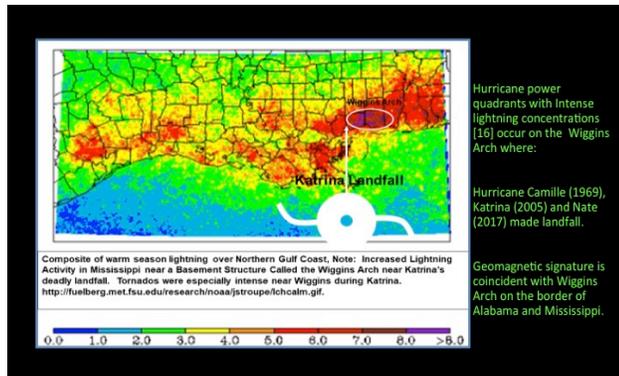
**Fig. 11. VAISALA [27] LIGHTNING DETECTION DATA** Yearly histograms (left), show a doubling of *Lightning* in 2003 year before three *Hurricanes* intersect Tampa Bay area. Concentration of most *Lightning* at mouth of Tampa Bay (middle), grounds to an ancient Triassic Rift underling the peninsular arch. Positive polarity (Blue Histogram - left) strikes are concentrated inland along the arch and interestingly form a delta circuit with concentrated *Lightning* in Tampa Bay (right).

In 2003 and 2004 *Lightning* strikes approximately doubled from a previous yearly mean under, 600,000 to over 1,000,000 (Fig. 11) within a 1 x 2 degree swath including the Tampa Bay and Lakeland region (Fig. 11). The majority of strikes north-northeast of Tampa Bay defines the most conductive grounding within this area. *Lightning* positive polarity strikes (Fig. 11) indicating ground affects, by the charge lowering from the clouds, shifted inland and were primarily focused over a geomagnetic anomaly (Fig. 10) under Lakeland.

Increased *Lightning* strikes, along geomagnetic anomalies may attract *Hurricanes* thermally and electromagnetically. The Tampa Bay-Lakeland region has more *Lightning* strikes than anywhere in the USA (Vaisala, Pers. Comm. [18]) and overlies a geomagnetic anomaly which 3 *Hurricane* paths intersected near the mouth of Tampa Bay during the 2004 *Hurricane* season (Fig. 10).

### 8. HURRICANE KATRINA

Intense *Lightning* concentrations [19] occur where *Hurricane* Camille (1969), Elaina (1985) Katrina (2005) Nate (2017) and Gordon (2018) made landfall (Fig. 15). The Wiggins Arch stretching from Mobil, AL to Wiggins, MS was grounding area for *Hurricane* Katrina and others. Geomagnetic signature is coincident with Wiggins Arch (Fig. 10), on the border of Alabama and Mississippi.

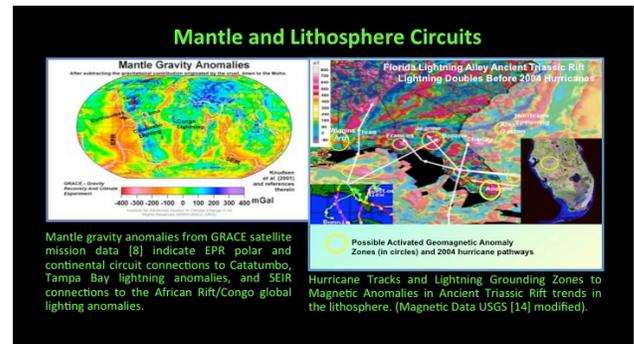


**Fig. 12. HURRICANE KATRINA** Intense *Lightning* (plots purple) [19] is attracted to the Wiggins Arch magnetic anomaly where powerful *Hurricanes* track. *Hurricane* Camille (1969), Katrina (2005) and Nate (2017) made landfall on this geomagnetic signature coincident with Wiggins Arch (Fig. 10), on the border of Alabama and Mississippi.

### 9. CAPACITANCE CONDENSER LAYERS

Ancient Triassic rift crustal circuits in southeastern U.S. and global *Mantle Circuits* (Fig. 13) are thought to be activated by *Solar Induction* currents and have connections to outer core modeled by Quinn as basalt flow remnant signatures (Not shown see [6]). These circuits were reactivated in 2003 when *Lightning* reached a million strikes per year. Nearly double the previous yearly average (Fig. 11). This doubling of *Lightning* activity is linked to a change in polarity of the *Solar Induction*. This changes the earth-sun relationship from a discharging to a charging cycle, increasing *Lightning* strikes and *Earthquakes*. Affects of many related phenomena may intensify globally during the induction changes.

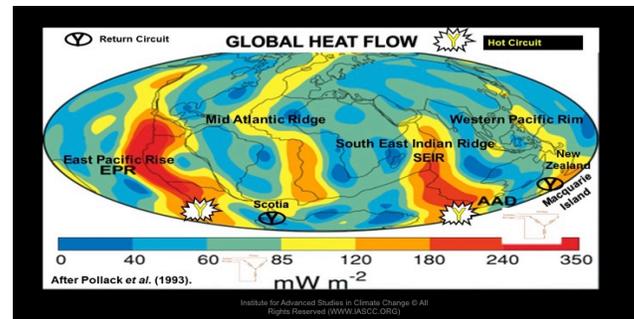
Caribbean circuits are tied to the East Pacific Rise as shown in mantle *Gravity* anomalies (Figs. 3, 9 & 13) and into North America through the antenna of the Florida Peninsular Arch and deeper circuits of the Mississippi Embayment linked to the New Madrid Seismic Zone and Great Lakes tectonic vortex. The mantle *Gravity* structure (left - Fig. 13) represents a deeper capacitance plate of the upper mantle. Shallower crustal *Magnetic* anomalies (right - Fig. 13) are associated with an ancient Triassic rift, and form an upper capacitance plate where *Lightning* grounds charging the plate, attracting equalizing charge from the lower plate triggering *Earthquakes*. *Hurricanes* tracks seem attracted to *Lightning* grounding areas, in Tampa Bay. African Congo *Lightning* grounds to radial induction element of the Southeast Indian Ridge (SEIR) while, Catatumbo *Lightning* on Lake Maracaibo, Venezuela grounds to axial induction elements of the East Pacific Rise (EPR) (Fig. 8).



**Fig. 13. CONDENSOR OR CAPACITANCE LAYERS** are revealed by mantle *Gravity* anomalies (left) from GRACE satellite mission data [4] connects polar circuits to north-south axial induction on the East Pacific Rise (EPR) vs. east-west radial induction on the South-East Indian Ridge (SEIR). And shallower crustal *Magnetic* anomalies (right) associated with an ancient Triassic rift in the lithosphere are linked to *Hurricane* tracks and *Lightning* grounding zones. (Magnetic Data USGS [17] modified).

### 10. GLOBAL HEAT FLOW

Induction heating along the “HOT” ridges indicated by change in global distributions of *Lightning*, alternatively heats the Southeast Indian Ridge (SEIR) from Radial Induction, and then shifts to the East Pacific Rise during Axial Induction (Fig. 14).



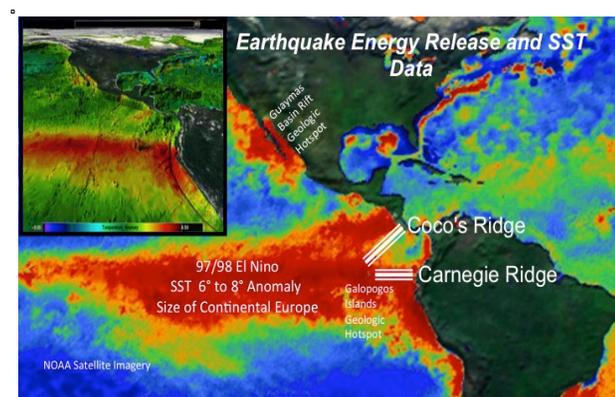
**Fig. 14. GLOBAL HEAT FLOW** from induction heats ridges alternatively heating the Southeast Indian Ridge (SEIR) during axial induction, and then shifts to the East Pacific Rise during radial induction. Most induction affects would be more complex than this simple explanation. Modified after Pollack et. al. (1993).

Return circuits along the Western Pacific Rim and Mid-Atlantic Ridge at times may also become active. These upper *Mantle Circuits* connect with inner/outer core circuits at the poles [1].

## 11. INTER-DISCIPLINARY PATH OF DISCOVERY BLAME IT ON EL NIÑO [20]

The path of discovery for *Stellar Transformer Solar Induction* was naturally inter-disciplinary [20]. Uncovering this *Solar Induction* phenomenon began in 1995 when a curious relationship exposed by Daniel Walker at the University of Hawaii, documented a 6-month *Earthquake* precursor to the El Niño over repeated events [21, 22, 23]. This relationship wasn't explained by Plate Tectonics within the literature. Possibly it was an oceanographic affect from warmer water and a stacking affect with additional weight as some scientist hypothesized. Possibly the pressure change between the Banda Sea Low, north of Australia and the Easter Island High off the west coast of Chile known as the Southern Oscillation (SO) had something to do with it? So, what causes the warm water and the pressure oscillation? And why would *Earthquakes* precede the *Climate Change* of El Niño Southern Oscillation (ENSO)? Is natural *Climate Change* also "Settled Science" [24]? What does the GHG scientists say drives natural *Climate Change*? Why can't they tell us? Way too many questions, how could the science possibly be settled?

Following up on the relationship of *Earthquake* precursors to El Niño, discussed by Walker [21, 22, 23] we developed data mining and visualization tools. Climate-Scope visualizes time series ocean Sea Surface Temperature (SST) anomaly data from National Oceanic and Atmospheric Administration (NOAA) (Fig. 15) with *Earthquake* data from National Earthquake Information Center. Results from data mining an *Earthquake* event during November 1996 are shown in Fig. 16.

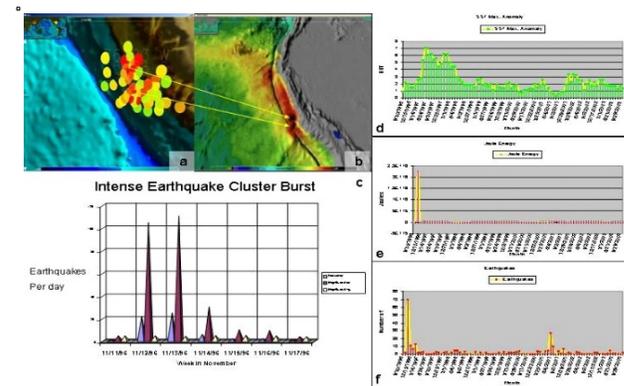


**Fig. 15. EL NIÑO SOUTHERN OSCILLATION (ENSO)** Peak sea surface temperature signal for the 1997/98 events. 6° – 8°C temperature anomaly about the size of continental Europe interestingly has a bifurcation that overlies local Mid-Ocean Ridge structure of the Coco's and Carnegie Ridge systems. Simultaneously the Guaymas Basin Rift coincidentally also has seafloor heat venting signatures?

The source of these dual surface temperature thermal plumes appear directly correlated to the dual seismic swarms of clustered *Earthquake* patterns (Figs. 16a and 16b). The northern cluster epicenter patterns appear on the continental shelf environment, while the southern cluster epicenters appear on the slope. The two SST anomalies appear associated with the two

separate (dual) *Earthquake* clusters. The northern SST's appear over the shelf, while the southern SST's appear over the slope (Fig. 16b.). A large 7.7 magnitude quake was observed during this event, triggering a small Tsunami in Hawaii (Walker, D.A., personal communication).

These dual thermal plumes (Fig. 16b) above the Peru Trench off the coast of South America in June 1997 signaled the beginning of the 1997/98 El Niño (Fig. 15), and are correlated to *Earthquakes* 6 months prior in the trench on 15 Nov. 96 (Fig. 16). The 6 - 8 month lag-time for Sea Surface Temperature (SST) anomalies (Fig. 16b & 16d) after this seismic event (Fig. 16e & 16f) are likely related to thermal energy transmigrations time [25] it takes heat to transfer from the base of the lithosphere at 33km depths. Shallow *Earthquakes* at the base of the lithosphere clustered quickly within 2 – 3 days as seen in Fig. 16c. *This event in the Pacific records precisely what Walker said existed!*



**Fig. 16. ENSO Seismic Activation Found** [Tectonic Forcing Function - 26, 27] On Nov. 1996 (a). Two distinct *Earthquake* clusters appear off South American Coast. (b). SST's seem to emanate in a similar pattern to the *Earthquake* paired clusters. Northern SST anomaly is on the continental shelf as is the northern *Earthquake* cluster. Southern SST anomaly is further offshore (continental slope) as is the southern *Earthquake* cluster. These SST anomalies appeared (June 1997) just north of *Earthquake* positions possibly due to prevailing long shore currents, about 7 months after the paired *Earthquake* clusters. (c). Chart indicates *Earthquakes/day* (Frequency), magnitudes are added for simple power indicator (Mag. Add), along with an average (Mag. Avg.) A spike in *Earthquake* activity begins Nov. 12<sup>th</sup> and tapers off Nov. 14<sup>th</sup> revealing events intense episodic nature. (d). SST Max. Anomaly/month indicating anomalies > 7° C by June 97 followed by a year of elevated SST anomalies associated with the 97/98 El Niño. (e). Joule energy released during (f). *Earthquake* events occurred in Nov. 1996.

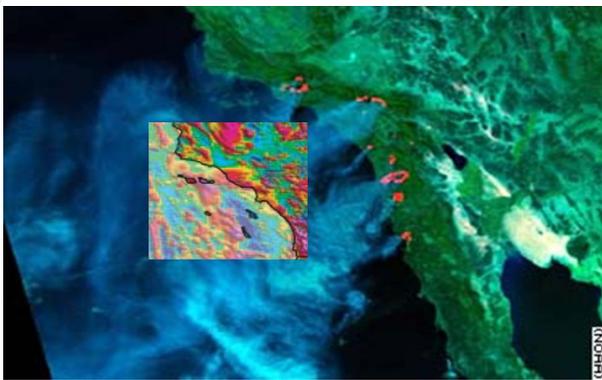
## 12. ST. ELMO'S WILDFIRES

Widespread California *Wildfire* outbreaks in 2003 [28] and 2017 occurred prior to and in conjunction with increased *Hurricane* seasons of 2004/05 and 2016/17 respectively and still ongoing at the time of this writing - Nov. 2018. This sequence of events is also related to the electrical activation of East Pacific Rise *Mantle Circuits* manifest as St. Elmo's fire [29].

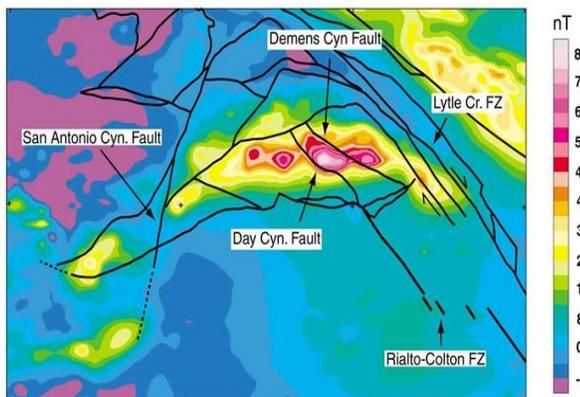
St. Elmo's fire is a glowing form of luminous bright blue/green or violet plasma, similar to neon lights. It is created from the ionization of nitrogen and oxygen molecules by the electric field around a conductive object. Usually a tall pointed structure.

Sailors observed this with religious awe and considered St. Elmo their patron saint as the phenomena often occurs on ships, especially on ship's masts during thunderstorms. It has also been known to occur during volcanic eruptions. High voltage differentials between clouds and ground must exist to create a local electric field of approximately 100 kV/m to induce a discharge in air. The geometry of an object controls the magnitude of the electric field, as charge build up on sharp points lower the necessary discharge voltage [29]. Perhaps this is also already considered "Settled Science". Possibly power companies are already considering this natural aspect in structural design for mitigating some types of western *Wildfire* outbreak? (Fig. 17)

These certain type of *Wildfire* outbreaks generally occur during a period of geomagnetic storms caused by induction from solar coupling. Historical evidence from the most powerful space storm on record in September 1859, hints at the relationship to *Wildfires* when telegraph wires shorted out in the United States and Europe, igniting widespread fires [30]. The strong solar storms (*Coronal Mass Ejections* – *CME's*) that hit Earth in the final week of October 2003 were small in comparison to the 1859 event, but may have electromagnetically induced an arced shaped pattern of fires. The fire pattern follows faulted crustal *Magnetic* anomaly trends arcing eastward just north of Los Angeles then southward around San Diego extending into the Mexican Baja along the coast (Fig. 17) [28].



**Fig. 17. Arc-shaped fire pattern** appears linked to faulted geomagnetic anomaly trends (insert).  
[http://activefiremaps.fs.fed.us/fire\\_imagery.php?firePick=southern\\_california](http://activefiremaps.fs.fed.us/fire_imagery.php?firePick=southern_california) & [http://pubs.usgs.gov/sm/mag\\_map/mag\\_s.pdf](http://pubs.usgs.gov/sm/mag_map/mag_s.pdf)



**Fig. 18. Murray Fracture Intersects San Andreas Fault** along Geomagnetic Anomalies in San Gabriel Mountains, > 800 nT.  
<http://wrgis.wr.usgs.gov/docs/gump/anderson/rialto/rialto.html>

A closer look at the geology of the San Gabriel Mountains lying beneath the outbreak of a huge firestorm along its slopes reveals strike-slip fault offsets with displacements up to ~2 km (Day Canyon and Demens Canyon Faults) transecting crustal *Magnetic* anomalies of up to 800 nT, nanotesla (Fig. 18). Consistent with Gregori's theoretical discussions [5, 7], the hypothesis of solar induced electrical *Wildfire* propagation is understood in terms of comparatively deep earth e.m. induction coupled to *Coronal Mass Ejections* creating the October 2003 geomagnetic storms. The induction process originates anomalous electric currents near the core-mantle- boundary from the deep internal geo-dynamo. Hotspots connect deep outer core circuits to electric circuits propagating into the mantle and shallow lithosphere fractions of the Earth.

### 13. DETECTION METHODS Radio Directional Finding (RDF)

The Radio Detection Finding (RDF) system of the Radio Emissions Project [31] is a geomagnetic detection system that provides global coverage for *Earthquake* detection of the entire terrestrial surface. This detects low frequency radio signals from *Earthquakes*, because they are electrical, and works similarly to *Lightning* detection networks that locate *Lightning* strike by the radio emissions albeit higher frequencies. This coverage is subdivided into regions to which very precise azimuths are associated. The monitoring station is located in Lariano (Rome) and was created by the Luminous Transient Phenomena in the Atmosphere (LTPA) Observer Project and Radio Emissions Project ([www.ltpaobserverproject.com/radio-emissions-project-real-time-data.html](http://www.ltpaobserverproject.com/radio-emissions-project-real-time-data.html)). Monitoring is carried out 24/7, and any *Magnetic* anomaly coming from around the globe can be promptly reported. The data serve for short-term forecast [31] One RDF station is insufficient to determine exactly the epicenter area of *Earthquake* and possibly precursor activity spark some *Wildfire* events, and for this reason several stations are located in various parts of the world. If we use the triangulation method (at least three monitoring stations) it will be possible to determine exactly the epicenter area and estimate the magnitude of the *Earthquake* about 20 hours before the main shock [32, 33]. Based on the received signals, it is possible to identify their precise axial position and direction of origin, with respect to the geographical point where the monitoring station is located. It is also possible to know the Azimuth (in degrees) with respect to the direction of detection and this therefore provides precise data on the axial location of the recorded radio signal. The new monitoring system is currently undergoing testing since March 2017, and has provided positive outcomes for *Earthquakes* greater than magnitude 4. Confirming *Earthquakes* are driven from solar E.M. induction and understanding the relationships to various solar activity, will herald in new challenges in *Earthquake* forecasting techniques based on *Space Weather*.

### Acoustic Emission Monitoring

Acoustic emissions (*AE*) diagnostic tools for environmental monitoring can be successfully used like real-time premonitory information, about the evolution of the internal state of several kinds of environmental environments (seismic, volcanic, geothermal, etc.) using natural structures like huge natural gravitational antennas to monitor some rocky outcrop. The monitoring instrument is composed of two parts, i.e. the

technological sensor placed on outcrop and the underground extension of such rocky block as a huge natural probe, of the natural system. Giving some detailed space-integrated information, which is achieved by no manmade probe. A key physical aspect deals with the *frequency* dependence of the *AE*. When dealing with flaws of some comparatively very small linear size, the mechanically vibrating structures shall be correspondingly comparatively very short, and the *AE* shall therefore be of comparatively higher frequency (*HF*). As soon as the size of the flaw increases, either due to the enlargement of one previous flaw, or to the coalescence of several previous smaller flaws (or both), some microspores of increasing size shall be formed, and the *AE* shall correspondingly become of progressively lower frequency (*LF*). This phenomenon implies e.g. that, when dealing with the application to some seismic fault structure, one shall expect to observe first some “paroxysm” monitored in some *HF AE*, e.g. say at 200 kHz. Later on, we shall expect to observe a paroxysm in some *LF AE*, e.g. say at 25 kHz. Moreover, while time elapses, the system shall evolve and release *AE* of comparatively progressively lower frequency, until eventually leaving the ultrasonic range and reaching the sonic range, which is the well known seismic roar, which precedes the subsequent lower frequency release (say at  $\sim 0.5 \div 1$  Hz) that characterises the occurrence of an *Earthquake* [34, 35, 36, 37, 38, 39].

#### 14. NATURAL DISASTERS FORECASTING WITH GEOPHYSICAL INTELLIGENCE

An *Interdisciplinary Forecasting* approach using an innovative electro-dynamic *Plasma Core* model of Earth with multi-phase circuits and our larger *Solar System* can be built with *Geophysical Intelligence*. Creating a comprehensive framework for understanding Earth’s interactions with *Space Weather*. *Stellar Transformer* concepts can be implemented with an improved understanding of common *Electro-Magnetic* denominators associated with *Space Weather* hazards (*Electro-Magnetic Pulse, EMP*), communications, general every day and extreme weather events, i.e. *Hurricanes, Tornadoes* associated with the variable frequencies of *Climate Change, Earthquakes, Volcanoes*, and certain types of *Wildfire* outbreaks associated with *Coronal Mass Ejections (CME’s)*. *Solar Induction* seems to have a dominant influence on natural phenomena worldwide. *Earth-Sun Stellar Transformer* model aligns *Space Weather* forecasting with *Geophysical Intelligence* uncovering the electrical relationships on earth driven in a *Space Weather* framework. Natural climate oscillations of Madden-Julian Oscillation (MJO), El Niño Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO) seem to be driven by changes in *Solar Induction* (Fig. 1). Thus *Climate Change* science is hardly “Settled Science.” These high frequency climate indexes of the MJO, ENSO & PDO, are considered natural and are not well understood at all. If the climate indices were well understood they would be easily forecast. *Natural Disasters* recently linked to *Solar Induction* affects [9, 10] are found to be a fundamental driver of natural *Climate Change*, with links to a host of related *Natural Disasters*. A much larger interdisciplinary space/earth science approach is justified as part of “*Space Force*” development. Considering the whole natural system including, but not focused primarily on the active role of the biosphere, as is the case of Green House Gas (GHG) theory. Focus on single subsystems i.e. solid earth, oceans, atmosphere, creates limited advantages. Looking at Earth’s *Endogenous Energy* as the larger whole with *Stellar Transformer* concepts

may account for this induction mechanism and unravel the mysterious links to *Natural Disasters* on our planet. Solar axial induction driving energy through Earth’s core could explain a lot of things that, to date, have remained elusive.

#### 16. CONCLUSIONS PREPONDERANCE OF THE EVIDENCE

Over the past 2 decades an ever-growing group of internationally networked scientist, along with an even larger group of layman, have diligently worked toward a new more inter-disciplinary understanding of our planets *Endogenous Energy* [5] and it’s link to solar drivers. The *Stellar Transformer* [1] concept can be considered as part of the scientific abstraction process that is at the basis of the exploratory analysis, as emphasized by John Tukey in 1977 [40]. This is preliminary to complete science, i.e. before the confirmatory analysis that has to be carried out in order to check the inferred consequences by means of observations. The exploratory analysis can also be identified with the role of “intuition” or of “thought”. Henri Poincaré claimed that “*thought is like a lightning in the middle of a long night. But this lightning is everything*”. The timing and global distribution of *Lightning* data along with the other environmental relationships exposed in this paper demonstrates a pathway to a new paradigm of understanding *Solar Induction* affects on our planet. A logical scheme backed with data analysis can create a step-by-step focus on increasingly better specific details of the processes and mechanisms of a new forecasting scheme. Developing an innate sense how the pieces “best” fit together occurs by testing different frameworks in a series of visualization processes supplemented with as much real data as possible.

Geomagnetic effects are inevitable, given the *Electro-Magnetic* output of the Sun and the fact that earth’s core is *Magnetic* and spinning. These effects may interact with and/or account for many well-known electric phenomena, such as aurora borealis and St. Elmo’s Fire. Geomagnetic effects may also affect the weather, through increasing or reducing the frequency and magnitude of *Lightning* in a particular local area. This could also lead to potential relationships between geomagnetic effects and *Lightning*-induced phenomena, such as *Wildfires*. It is also plausible that the large forces associated with geomagnetic phenomena can impact or trigger phenomena such as earthquakes and *Volcanoes*. Since we know a lot about the physical structure of the earth and can measure *Electro-Magnetic* output of the sun, with an improved model it may be possible to predict localized activities (e.g., *Lightning, Earthquakes, Volcanoes, Wildfires*) as the examples given describe. These examples open the possibility that some effects that are currently being ascribed to human-induced global *Climate Change* may, in fact, be the result, in whole or in part, of geomagnetic processes. Furthermore, geomagnetic forces should be predictable. Allowing these hypotheses to be tested and, potentially, falsified. Something much harder to do with model based simulations of global climate. The highly interdisciplinary nature and complexity of climate science as demonstrated within this paper, would require the *Solar Induction* effects to be superimposed on top of the various existing climate models to improve predictive power. Creating a composite “best” model advancing interdisciplinary forecasting to a new level of understanding necessary for ventures into space. The very concept of “settled science” serves to suppress

the investigation of relationships that may, in fact, exist outside of widely used climate models.

Persistence with a preponderance of the evidence, and some most excellent international collaboration with like-minded scientist are what really made the advances in this particular interdisciplinary scientific investigation possible. When scientific problems seem to have no solution, new ways of looking at things, i.e. theories, frameworks, hypothesis etc., are an absolute necessity and becomes an advantageous scientific skill. After looking at enough observational data, the relationships begin to emerge from repeated pattern recognition. We are well on are way to figuring this out, despite mainstream opposition and active suppression of these ideas through the mainstream “peer review process” of our grants and papers. In the information age the mainstream “Echo Chamber” that thinks the “Science is Settled” (IMSCI Participatory Panel, 2018 [24]), is out of touch and slowly losing its relevance as this international debate takes form around new exciting concepts in inter-planetary space physics that hold an advanced more practical understanding of our space environment. Ample historical databases exist that can be analyzed for the purpose of detecting other correlations similar to those that we have observed. Moreover, the model that we proposed differs from existing climate models (that do not incorporate *Solar Induction* effects) in that it can be tied to specific geographical locations and observed solar phenomena. As a consequence, it would seem to offer considerable advantages in predictive power at the local level should these relationships be confirmed. Some very compelling evidence is in, the jury is still out. How long will it take to look into? The clock is ticking.... the next *Natural Disaster* is always just around the corner. The challenge is to have a better understanding of what’s coming!

## 17. REFERENCES

- [1] Leybourne, B.A., James ‘Mick’ Davis, Giovanni P. Gregori, John M. Quinn, and N. Christian Smoot, **Evolution of Earth as a Stellar Transformer**, New Concepts in Global Tectonics Journal, V. 5, No. 1, March 2017, pp. 144-155. See: [www.iascc.org/the-science](http://www.iascc.org/the-science).
- [2] Leybourne, B.A., **Solar Induction Driver and Much More: An Interdisciplinary Forecasting Approach**, The 12<sup>th</sup> International Multi-Conference on Society, Cybernetics and Informatics (IMSCI), Orlando, FL, *Conf. Program*, p. 46, 10 July 2018.
- [3] Thornhill, W. and Talbott, D., 2007. *The Electric Universe*, Mikamar Publishing (May 24, 2007), 132p.
- [4] Knudsen, Per, Ole Andersen, Shfaqat Abbas Khan, and Jacob Høyer, **Ocean tide effects on GRACE gravimetry**, 8 p. in *Sideris (2001)*. Sideris, Michel G., (ed.), 2001. Gravity, geoid, and geodynamics 2000, *IAG Symposia*, **123**, 398 pp., Springer-Verlag, New York.
- [5] Gregori, G.P., *Galaxy-Sun-Earth Relations: The origins of the magnetic field and of the endogenous energy of the Earth*, *Arbeitskreis Geschichte Geophysik*, ISSN: 1615-2824, Science Edition, W. Schroder, Germany, 2002.
- [6] Quinn, J.M., *Global Warming: Geophysical counterpoints to the enhanced greenhouse theory*. Dorrance Pub., 118p., 2010.
- [7] Gregori, G.P., 2014. **Climate and the atmospheric electrical circuit: the electromagnetic coupling between solar wind and Earth**. *NCGT Journal*, v. 2, no. 1, p. 99-112.
- [8] Albrecht, R. I., S. J. Goodman, D. E. Buechler, R. J. Blakeslee, and H. J. Christian, **Where are the lightning hotspots on Earth?**, Bulletin American Meteorology Soc. doi:10.1175/BAMS-D-14-00193.1, 2016. See News Article @: [www.northcollierfire.com/wp-content/uploads/2016/05/Latest-News-Lightning-Capital-of-US.pdf](http://www.northcollierfire.com/wp-content/uploads/2016/05/Latest-News-Lightning-Capital-of-US.pdf)
- [9] Leybourne, B.A., **Hurricane Irma 2017: Relationships with Lightning, Gravity, and Earthquakes**, New Concepts in Global Tectonics Journal, in Letters to the Editor, v. 5, no. 3, September, 2017, pp. 339 – 343.
- [10] Leybourne, B.A., **Hurricane Irma 2017: Relationships with Lightning, Gravity, and Earthquakes**, The 12<sup>th</sup> International Multi-Conference on Society, Cybernetics and Informatics (IMSCI), Orlando, FL, *Conf. Proceedings*, p. 52-58, 11 July 2018.
- [11] Christian, Hugh J. , Richard J. Blakeslee, Dennis J. Boccippio, William L. Boeck, Dennis E. Buechler, Kevin T. Driscoll, Steven J. Goodman, John M. Hall, William J. Koshak, Douglas M. Mach, and Michael F. Stewart, **Global frequency and distribution of lightning as observed from space by the Optical Transient Detector**, "J. Geophys. Res.", 108(D1), 4005, doi:10.1029/2002JD002347, 2003."
- [12] Codazzi, A., *Resuïmen de la Geografía de Venezuela*. Impr. de H. Fournier y compia, pp. 648, 1841.
- [13] Court, A., and J. F. Griffiths, 1982: Thunderstorm climatology. *Thunderstorm Morphology and Dynamics of Thunderstorms: A Social, Scientific, and Technological Documentary*, E. Kessler, Ed., University of Oklahoma Press, 11–52.
- [14] Goodman, S. J., and H. J. Christian, **Global observations of lightning**. *Atlas of Satellite Observations Related to Global Change*, R. J. Gurney, J. L. Foster, and C. L. Parkinson, Eds., Cambridge University Press, 191–219, 1993.
- [15] Ba, M. B., and S. E. Nicholson, **Analysis of convective activity and its relationship to the rainfall over the Rift Valley Lakes of East Africa during 1983–90 using the Meteosat infrared channel**. *J. Appl. Meteor.*, **37**, 1250–1264, doi:10.1175/1520-0450, 1998.
- [16] Barros, A.p., G. Kim, E. Williams, and S. W. Nesbitt, 2004: **Probing orographic controls in the Himalayas during the monsoon using satellite imagery**. *Nat. Hazards Earth Syst. Sci.*, **4**, 29–51, doi:10.5194/nhess, 4-29-2004.
- [17] USGS, **Magnetic anomaly map of North America**. <https://mrdata.usgs.gov/geophysics/map.html#>
- [18] Vaisala commercially operates the **Lightning Detection**

Network in the U. S.

<https://www.vaisala.com/en/products/data/data-sets/nldn>

- [19] Smith, J.R., H.E. Fuelberg, and A.I. Watson, **Warm season lightning distributions over the northern Gulf of Mexico coast and their relation to synoptic scale and mesoscale environments**. *Wea. and Forecasting*, 2005, 20, 415-438.
- [20] Leybourne, B.A. and Adams, M.B., 2001. **El Nino tectonic modulation in the Pacific Basin**. *Marine Technology Society Oceans '01 Conference Proceedings*, Honolulu, Hawaii, Nov. 2001.
- [21] Walker, D.A., 1988. **Seismicity of the East Pacific: correlations with the Southern Oscillation Index?** *EOS Trans. AGU*. V. 69, p. 857.
- [22] Walker, D.A., **More evidence indicates link between El Ninos and seismicity**. *EOS Trans. AGU*. 76 (33) 1995.
- [23] Walker, D.A., 1999. **Seismic Predictors of El Nino Revisited**. *EOS Trans. AGU*, v. 80, no. 25.
- [24] Gill, T.G, N. Callaos, IMSCI Participatory Panel, **Knowledge Communication and Peer Reviewing**, The 12<sup>th</sup> International Multi-Conference on Society, Cybernetics and Informatics (IMSCI), Orlando, FL, 4:00-4:45pm, 08 July, 2018.
- [25] Blot, C., 1976. **Volcanisme et séismicité dans les arcs insulaires. Prévision de ces phénomènes**. Géophysique, v. 13, Orstom, Paris, 206p.
- [26] Leybourne, B.A., 1996. **A tectonic forcing function for climate modeling**, *EOS, Transactions, American Geophysical Union, Western Pacific Geophysics Meeting*, 1996, May 28th supplement, #A42A-10.
- [27] Leybourne, B.A., 1997. **Earth-ocean-atmosphere coupled model based on gravitational teleconnection**. Proc. Ann. Meet. *NOAA Climate Monitoring Diag. Lab.* Boulder Co. March 5-6, 1997, p. 23. Also: *Proc. Joint Assemb. IAMAS-LAPSO*. Melbourne, Australia. July 1-9, 1997. JPM9-1.
- [28] Leybourne, B.A., A. Haas, B. Orr, N.S. Smoot, I. Bhat, D. Lewis, G. Gregori, **Electrical wildfire propagation along geomagnetic anomalies**, *The 8th World Multi-Conference on Systemics, Cybernetics and Informatics*, Orlando, FL., (July 18-24) 2004, pp. 298.
- [29] Darwin, Charles R., 1839. **Narrative of the surveying voyages of His Majesty's Ships Adventure and Beagle between the years 1826 and 1836, describing their examination of the southern shores of South America, and the Beagle's circumnavigation of the globe**. *Journal and remarks. 1832-1836*. London: Henry Colburn. p. 619.
- [30] Tsurutani, B.T., Gonzalez, W.D., Lakhina, G.S., and Alex, S., **The extreme magnetic storm of 1-2 September 1859**, *Journal of Geophysical Research*, Vol.108, No. A7, p. 1268, 2003.
- [31] Straser, V., Cataldi, G., and Cataldi, D., **Radio-anomalies: a tool for earthquake and tsunami forecasts**. European Geosciences Union (EGU) General Assembly 2015, Natural Hazard Section (NH5.1), Sea & Ocean Hazard - Tsunami, Geophysical Research Abstract, vol. 17, Vienna, Austria. Harvard-Smithsonian Center for Astrophysics, High Energy Astrophysics Division, SAO/NASA Astrophysics Data System, 2015.
- [32] Straser, V., Cataldi, G. and Cataldi, D., **SELF and VLF electromagnetic signal variations that preceded the Central Italy earthquake on August 24, 2016**. *NCGT Journal*, vol. 4, no. 3, p. 473-477. Harvard- Smithsonian Center for Astrophysics, High Energy Astrophysics Division, SAO/NASA Astrophysics Data System, 2016.
- [33] Straser, V., Cataldi, G. and Cataldi, D., **Seismic signals detected in Italy before the Nikol'skoye (off Kamchatka) earthquake in July 2017**. *NCGT Journal*, vol. 5, no. 3, p. 391- 396, 2017.
- [34] Gregori, G. P., and G. Paparo, **Acoustic emission (AE). A diagnostic tool for environmental sciences and for non destructive tests (with a potential application to gravitational antennas)**, in *Schröder*, 166-204, 2004.
- [35] Gregori, G. P., G. Paparo, M. Poscolieri, C. Rafanelli, G. Ventrice, G. P. Garilli, L. Imperatori, F. Lo Castro, and G. Zimatore, **The seismic sequence in Central Italy (August-November Acoustic Emission (AE) monitoring and analysis**, *New Concepts Global Tect. J.*, 4, (4), 637-663, 2016.
- [36] Gregori, G. P., G. Paparo, U. Coppa, and I. Marson, **Acoustic emission in geophysics: a reminder about the methods of analysis**. *Boll. Geofis. Teor. Appl.*, 43, (1/2), 157-172, 2002.
- [37] Gregori, G. P., M. Poscolieri, G. Paparo, S. De Simone, C. Rafanelli, and G. Ventrice, **"Storms of crustal stress" and AE earthquake precursors**, *Nat. Hazards Earth Syst. Sci.*, 10, 319-337, 2010.
- [34] Paparo, G., and G. P. Gregori, **Multifrequency acoustic emissions (AE) for monitoring the time evolution of microprocesses within solids**. *Reviews of Quantitative Nondestructive Evaluation*, 22, (AIP Conference Proceedings ed. by D. O. Thompson and D. E. Chimenti), 1423-1430, 2003.
- [38] Paparo, G., G. P. Gregori, A. Taloni, and U. Coppa, **Acoustic emissions (AE) and the energy supply to Vesuvius – 'Inflation' and 'deflation' times**. *Acta Geod. Geophys. Hung.*, 40, (4), 471-480, 2004.
- [39] Paparo, G., G. P. Gregori, M. Poscolieri, I. Marson, F. Angelucci, and G. Glorioso, **Crustal stress crises and seismic activity in the Italian peninsula investigated by fractal analysis of acoustic emission (AE), soil exhalation and seismic data**. In *Cello and Malamud*, 47-61, 2006.
- [40] Tukey, John W., **Exploratory data analysis**. Addison-Wesley Publ. Co., Reading, Mass. – Menlo Park, Cal., London, Amsterdam, Don Mills, Ontario, Sidney, XVI, 688 pp., 1977.