ELECTRICAL WILDFIRE PROPAGATION ALONG GEOMAGNETIC ANOMALIES: A SOLAR INDUCTION PROCESS

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Update – 2018 Wildfire in Paradise Lost

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ABSTRACT

Recent wildfire outbreaks during a period of geomagnetic storms in October 2003 may be linked to electrical emanations from within the earth. Efforts to understand the behavior of these fire outbreaks and create forecasting tools is an ongoing commercial development linked to new theoretical considerations in tectonics and geomagnetic 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[1]. The strong solar storms that hit Earth in the final week of October 2003 were small in comparison to the 1859 [1] event but may have electromagnetically induced an arced shaped pattern of fires. The fire pattern follows crustal magnetic anomaly trends arcing eastward just north of Los Angeles then southward around San Diego extending into the Mexican Baja along the coast (Fig1).

Keywords: Wildfires, Mitigation, Geomagnetic Induction, Solar Coupling, Tectonics.

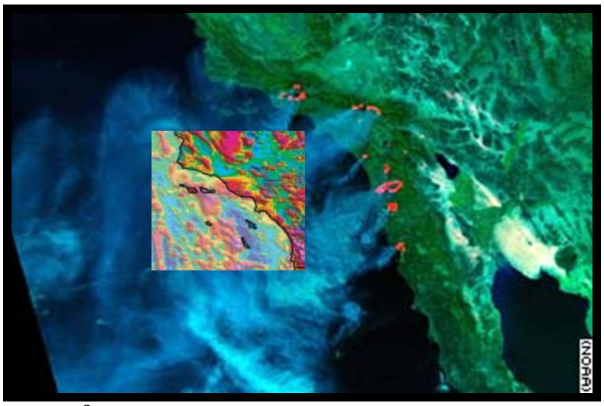

Fig.1. [2]Arc-shaped fire pattern appears linked to geomagnetic anomaly trends (insert).

1. INTRODUCTION

Consistent with Gregori's theoretical discussions [2], 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-geodynamo. Hotspots are hypothesized to connect deep circuits to electric circuits propagating into shallow lithosphere fractions of the Earth. Some anomalous coupling between tectonic and ionosphere electric currents may be expected along particular conductive pathways characterized by Meyerhoff [3, 4] as surge channels. Typically, these features follow major tectonic trends, such as mid-oceanic ridges and fracture zones exhibiting hotspots or hot lines [5]. Hotspot locations such as the Guaymas Basin Rift in the Gulf of California link conductive pathways to the core-mantle-boundary. These conductive zones merge along the East Pacific Rise extension into the North American Continent continuing along the San Andreas Fault System and completing circuits with other fault systems and local magnetic anomalies such as those in the St. Gabriel Mountains. Such locally anomalous e.m. coupling between ground and ionosphere is eventually further enhanced through power line ground arcing, igniting combustible materials, destroying power systems, and creating a firestorm along local magnetic trends and fault patterns.

2. GEOLOGIC - TECTONIC SETTING

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 (Day Canyon and Demens Canyon Faults) transecting crustal magnetic anomalies of up to 800 nT -nanotesla (Fig. 2). Fault displacements up to ~2 km is displayed along mylonite shear zones (Fig. 3). Mylonite is a rock which has been crushed

[1] See: http://www.nasa.gov/home/hqnews/2003/oct/HQ_03344_perfect_space_storm.html [1]
http://www.agu.org/pubs/crossref/2003/2002JA009504.shtml [1]

[2] See: http://activefiremaps.fs.fed.us/fire_imagery.php?firePick=southern_california
http://pubs.usgs.gov/sm/mag_map/ mag_s.pdf

and ground down by earth movement and at the same time rendered compact by pressure, fine-grained and often banded in parallel fashion with stripes of varying composition and conductivity. Within the San Gabriel Mountains, metamorphosed sedimentary rock and associated plutonic rocks and high grade metamorphic rocks are overprinted by a distinctive belt of mylonitic deformation locally intense enough to create a distinct mylonite unit. The San Gabriel Mountains are a fault-bounded block of ancient crystalline rocks north of the Los Angeles Basin and the upper Santa Ana River Basin. The range is fault-bounded on the north by the San Andreas Fault zone, on the south and southwest by thrust and reverse faults of the Cucamonga-Sierra Madre fault complex, and on the east by faults of the San Jacinto zone. The mountain range is complexly deformed by faults of many different ages and tectonic styles [6, 7, 8].

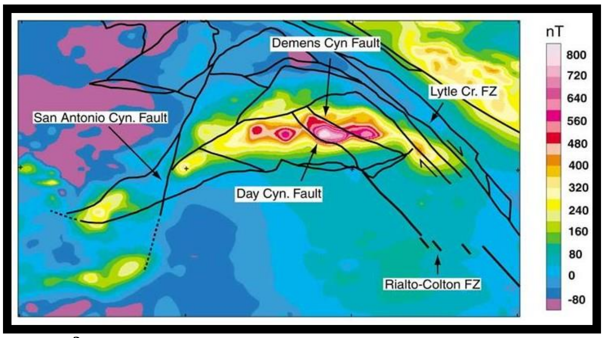

Fig. 2. [3]Geomagnetic anomalies in San Gabriel Mountains along intersecting faults and mylonite units.

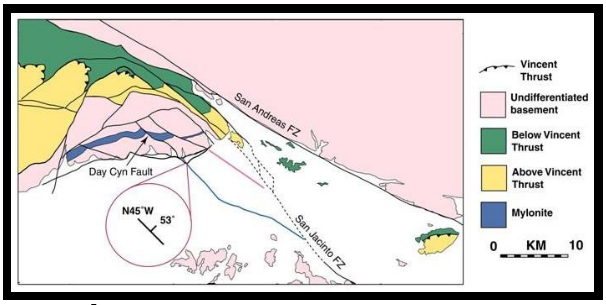

Fig. 3. [3]Mylonite trend along faults overprint largest geomagnetic anomalies in San Gabriel Mountains.

3. CONCLUSIONS

This type scenario could explain bursts of wildfire outbreaks, which don't seem reasonably explained in extent and magnitude by arson or other mechanisms. Such essentially transient phenomena associated with the temporary transient e.m. induction by solar perturbations, ought to be correlated with anomalous geothermal occurrences, gaseous exhalations, and variations of soil porosity. These phenomena may be detectable by recording Acoustic Emissions (*AE*), in the ultrasound band [9] within geomagnetic induction zones. Early warning of wildfires may be possible by monitoring (*AE*) precursors and correlating solar activity with Solar and Heliospheric Observatory (SOHO) data. If lightning strike data geospatially correlates to local power grid networks during geomagnetic events at point locations of fire outbreak origins, then a convincing case for electrical wildfire propagation as proposed can be made, and experiments setup to capture an event. Mitigation scenarios may be possible, such as clearing brush in most hazardous areas, creating electrical capture or dispersal mechanisms, and/or dropping power stations offline during critical periods. The latter effort would require precise geographical prediction and timing of these events, currently under investigation by Geostream Consulting and Earth Climate Research Institute (*ECRI*).

4. *UPDATE - 2018 WILDFIRE IN PARADISE LOST*

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Wildfire

Are certain types of wildfire outbreaks related to Coronal Mass Ejections?

Outbreaks in California in 2003-04 [10] and again in 2017-18 occurred in conjunction with increased hurricane seasons of 2004-05 and 2016-17 respectively. The Stellar Transformer hypothesis [11] implies this occurs from solar induction associated with Electro-Magnetic Pulse (EMP) from Coronal Mass Ejections (CME's) documented during the Oct. 31, 2003 Halloween fires [10]. Research indicates this sequence of events is related to radial induction "coils" [12] along orthogonal fracture patterns in the Pacific Ocean Basin (Fig. 4).

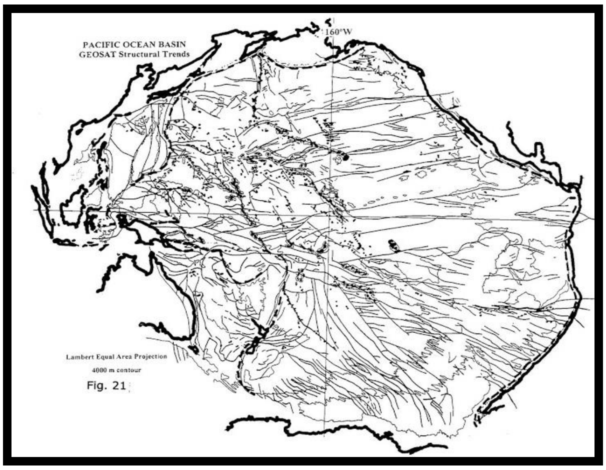

Fig. 4. 1995 High-Pass Filtered GEOSAT Structural Diagram of Pacific Basin Trends [13] where some of the trends go ashore, i.e. Paradise (2018) fire along Mendocino Fracture and San Bernardino (2003) fires along Murray Fractures (Fig. 5).

Wildfires breakouts are near where orthogonal fractures intersect the Continental U.S. (Fig. 5) along an extension of the East Pacific Rise mantle circuit (San Andres Fault) and may be activated by solar induction. The Murray Fracture Zone is associated with wildfires near large arc shaped geomagnetic anomalies [10] through San Bernardino in 2003 & 2017, while the Mendocino fracture intersects large volcanic plutons associated with the Paradise – Camp Fire in 2018 (Fig. 5). "The Camp Fire burn area is bisected by the Long Ravine, Big Bend, Magalia and Chico Monocline faults. Only the Chico Monocline shows evidence of recent fault displacement (i.e. within the past 1.6 million years)

[3]See: http://wrgis.wr.usgs.gov/docs/gump/anderson/rialto/rialto.html

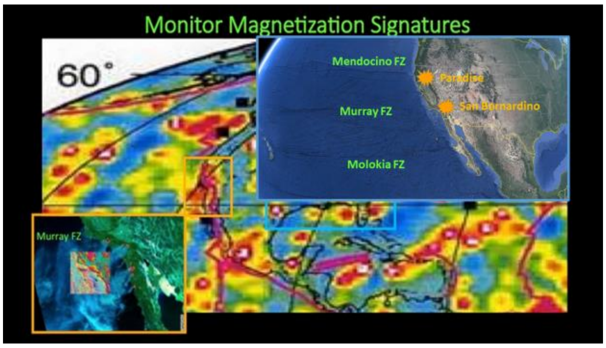

Fig. 5. Magnetic Modeling North American zoom into Wildfire & Earthquake Region with large magnetic signatures along San Andreas trends intersection (upper right inset) with "Pacific Fracture" (Mendocino, Murray, Molokai) "Wildfire Breakout Zones". Lower inset 2003 Halloween wildfire outbreak along Murray Fracture associated with Coronal Mass Ejections [10]. Structure in lithospheric magnetic source depths: Red and Yellow are between the 30-70km ranges; while blues and greens are from 70-400km [14]. Courtesy John M. Quinn, Solar-Terrestrial Environmental Research Institute (STERI).

Fig. 6. Paradise Campfire Origins indicate downed power line towers. Were the tower bases melted? What forces destroyed the tower bases… simple wildfire propagation or strong ground solar induction currents? (Google Earth Image – 11 Dec. 2018)

within the burn area" [15, 16]. This area is where power line tower bases seemingly fell over from melting. Is it possible the power tower bases could turn to molten metal (Fig. 6) from energy grounding out to or emanating from volcanic magnetic terrains (i.e. plutons)? This possibility can be understood in terms of an extreme manifestation of St. Elmo's fire, during large Total Electron Content (TEC) events (Fig. 7). St. Elmo's fire is a glowing form of luminous bright blue or violet plasma, similar to neon lights. It is formed from the ionization of nitrogen and oxygen molecules by the electric field around tall conductive objects. 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 [17]. 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. These wildfire outbreaks generally occur along volcanic geomagnetic terrains during periods of geomagnetic storms induced from solar coupling. Historical evidence from the most powerful space storm on record in September 1859 Carrington Event, hints at the relationship to wildfires when telegraph wires shorted out in the United States and Europe, igniting widespread wildfires simultaneously on both continents [18]. Monitoring EM activity along these fracture intersections may give early warning of fire out breaks along these systems. The induction characteristics are determined by current alignments between layers in the Earth and polarity relationships primarily between Earth-Sun. The alignment and polarity determine the attraction or repulsive forces i.e. the charging and discharging forces on our planet [11].

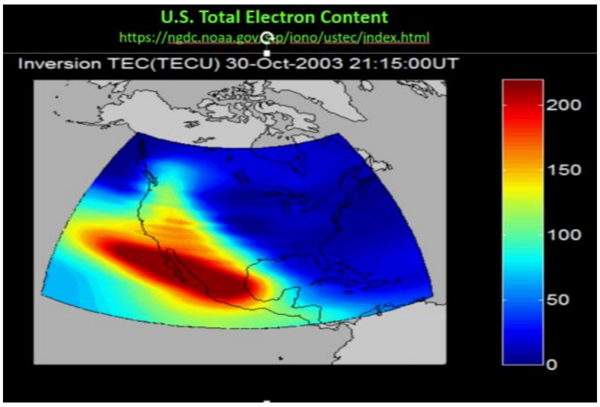

Fig. 7. Total Electron Content charge stacks up over the event area due to Solar Coronal Mass Ejections 30 Oct 2003, just before Halloween wildfire ignition on 31 Oct 2003 (NOAA).

5. CORONAL STREAMER MERCURY MAGNETOSPHERE TAIL SLAP

The coronal streamer in Fig. 8 ejects enough plasmoid from the sun's corona to create a coronal mass ejection, the morning of 08 November 2018. When the Paradise Fire sparked up and is likely the wildfire driver. Mercury is seen as a bright spot just below the streamer.

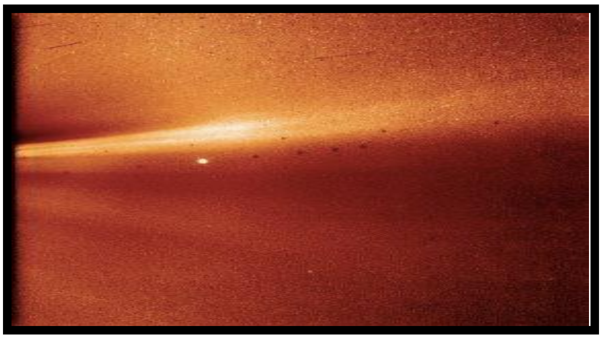

Fig. 8. "Stealth" Coronal Streamer from Parker Solar Probe's WISPR (Wide-field Imager for Solar Probe) shows a coronal streamer over the east limb of the Sun on Nov. 8, 2018, at 1:12 a.m. EST. Streamer is very clear, with at least two rays visible, bright object near the center of the image is Mercury, the dark spots are a result of background correction. Credit: NASA/Naval Research Laboratory/Parker Solar Probe - https://phys.org/news/2018-12-discovery-nasa-parker-solar-probe.html

[3]See: http://wrgis.wr.usgs.gov/docs/gump/anderson/rialto/rialto.html

As seen from the Earth and certain spacecraft the Sun seemed to be calm, but the coronal streamer (Fig. 8) seen with the Parker Solar Probe (Fig. 9) was indeed a coronal mass ejection directly impacting Mercury, inducing a 3,030 mile magnetosphere tail wave, the diameter of Mercury, which would be capable of impacting the Earth. Mercury's diameter is comparable to the size of the continental United States about two-fifths the size of Earth.

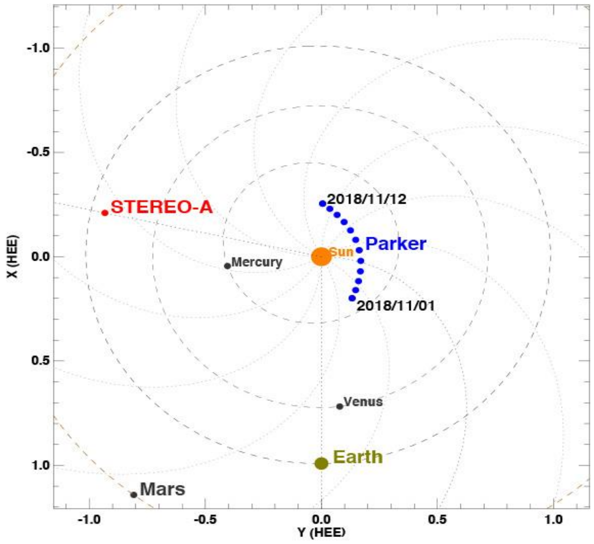

Fig. 9. Location of Spacecraft STEREO-A with Parker moving the outer solar corona between 01-12 Nov. 2018. Credit: NASA/GSFC. https://svs.gsfc.nasa.gov/13113

This interesting E.M. harmonic could have triggered a radial induction effect along the Mendocino Fracture Zone (Fig. 5) by providing a magnetosphere tail slap from Mercury (Fig. 10 – Top left to right shows a time lapse of a similar 2017 CME wave modification by Mercury).

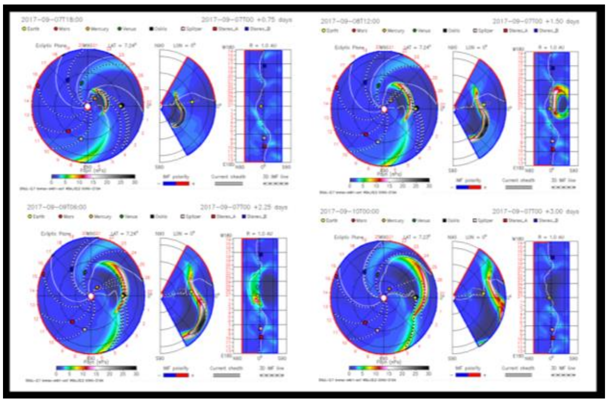

Fig. 10. "Stealth" Coronal mass Ejection from Parker Solar Probe's WISPR (Wide-field Imager for Solar Probe). From top left to right shows 4-time lapse of a similar 2017 CME wave modification by Mercury, showing the plausibility of such a magnetosphere tail slap effect.
https://iswa.gsfc.nasa.gov/IswaSystemWebApp/

This mechanism could be responsible for triggering the Paradise wildfire outbreak (Fig. 11) along deep embedded volcanic rocks, (plutons) along orthogonal intersecting megatrends, or "Coils" of a Stellar Transformer [12]. Mercury also has a unique harmonic solar relationship in that it rotates in a way that is tidally locked with the Sun in a 3:2 spin–orbit resonance, meaning it rotates on its axis exactly three times for every two revolutions it makes around the Sun [19]. The spacecraft MESSENGER discovered an extremely "leaky" magnetic field on Mercury, when it encountered magnetic tornadoes (Fig. 12) up to 800 km wide, a third of the radius of the planet. These twisted magnetic flux tubes, technically known as flux transfer events connect the planetary magnetic field to interplanetary space [20].

Thus, magnetic tornadoes or an E.M. wave with a large wavelength the size of the continental U. S. is hypothesized to trigger the Nov. 2018 Paradise wildfire outbreak event. CME's have already been associated with wildfire outbreaks along other Pacific Ocean fracture zones, such as the Murray Fracture Zone further south with San Bernardino wildfire outbreaks in 2003 [21].

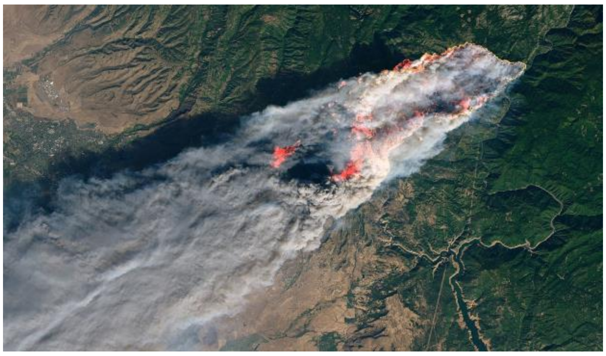

Fig. 11. Camp Fire erupted morning of 08 November 2018. The fast-moving fire had charred around 18,000 acres by that evening, and was zero percent contained. The natural-color image was created using bands 4-3-2, along with shortwave infrared light to highlight the active fire. Image credit from: Operational Land Imager (Landsat 8) acquired 08Nov. 2018 ~10:45 LST.

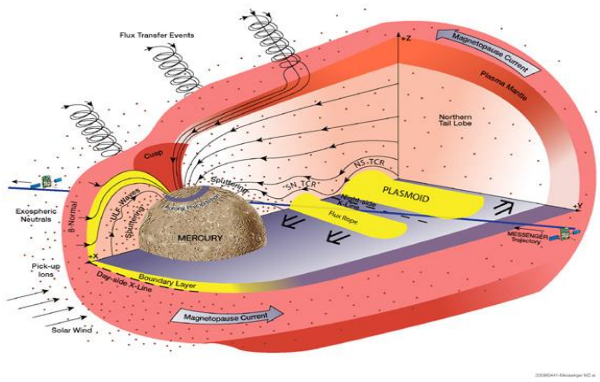

Fig. 12. Magnetic Tornadoes diagram from 06 Oct. 2008 flyby, show corkscrew bundles of twisted vortex structured magnetic fields and plasma forming in Mercury's magnetosphere [20]. (Credit: NASA/Goddard Space Flight Center/John Hopkins University Applied Physics laboratory/Carnegie Institution of Washington)

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