ELECTRICAL WILDFIRE PROPAGATION ALONG GEOMAGNETIC ANOMALIES: A SOLAR INDUCTION PROCESS

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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 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.

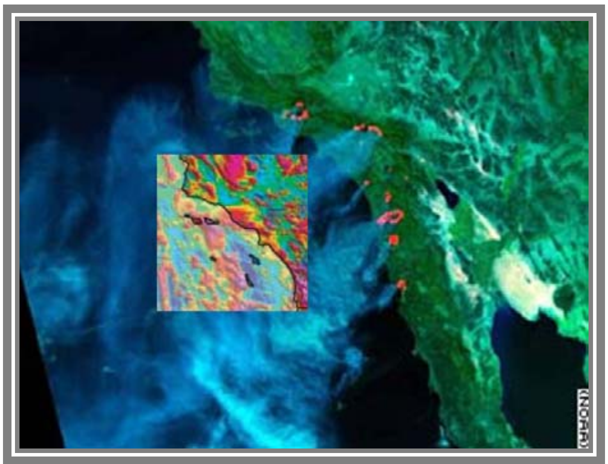

Fig.1. [2]Arc-shaped fire pattern appears linked to geomagnetic anomaly trends (insert).

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 are displayed along mylonite shear zones (Fig. 3). Mylonite is a rock which has been crushed 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

[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 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].

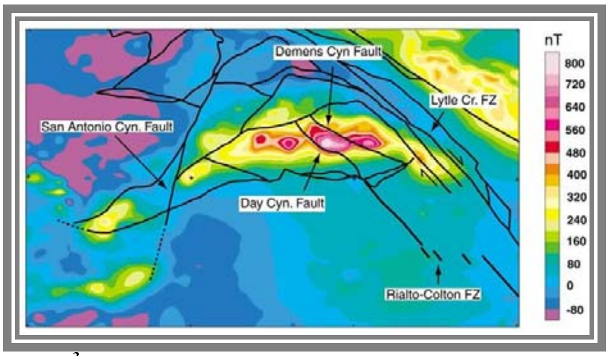

Fig. 2. [3]Geomagnetic anomalies in San Gabriel Mountains along intersecting faults and mylonite units.

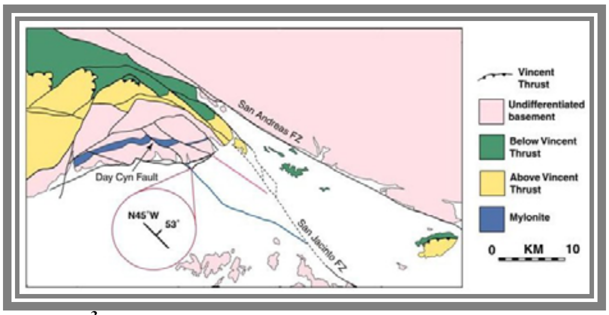

Fig. 3. [3]Mylonite trend along faults overprint largest geomagnetic anomalies in San Gabriel Mountains.

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. REFERENCES

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