

STRATEGIC DEVELOPMENT OF REAL TIME SYSTEM TO PREDICT EARTHQUAKE BY USING CUSTOMIZED SATELLITE SYSTEM

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ABSTRACT:

Reliable, Repeatable Earthquake forecast is a subject surrounded by controversy and scepticism. What is clear is that reliable forecast would be a critical tool for effective earthquake disaster management. It is proposed that satellites and ground-based facilities may detect earthquake precursors in the F region of Ionosphere and Temperature Changes in Atmosphere a few hours or days before the main shock.

It is proposed that, due to the anisotropy of atmospheric conductivity at heights greater than 60 km, the large-scale, high-intensity (ca. 1000 V m^{-1}) vertical electric field appearing at seismically active regions a few days before strong earthquakes can penetrate into the ionosphere and create specific irregularities of electron concentration in this region (Pulinets et al. 1998). This anomalous quasistatic electric field generated on the ground in a seismo-active zone is detected through the Seismogenic Variations in the near-Earth plasma due to the high conductivity along the geomagnetic field lines.

Several observations were made of Very Low Frequency (VLF) emissions apparently associated with earthquakes, which were recorded independently at ground-based stations and on satellites. Data were analysed for those cases when both intense ($M_s > 5$) earthquakes occurred in the region close to the satellite longitude and the satellite was operating in the VLF mode. A statistical analysis, based on the enhancement of wave intensity at the time of earthquakes and using GEOS-2 data, seems to indicate that there is a (possibly indirect) association between seismic activity and some of the VLF emissions observed at the satellite. Ionospheric measurements made from the ground also showed an increase of the critical frequency f_0E_s of the sporadic layer E_s when earthquakes occurred nearby.

Other than the changes of Electromagnetic Waves & Electric Field in F region due to Earthquake, it is also under observation since last several years that atmospheric temperature is also varying before, during and after the earthquake where it is occurring i.e. epicentre. Changes in Temperature is very fluctuating which is observed from the Satellite Thermal Data of the Earthquake Affected Areas. Studying of Radiant Temperature can be done in Real Time basis by using the Thermal Satellite Data and as well as the RADAR Data.

As, there is a change of electromagnetic waves & electric field due to earthquake in F region and temperature changes in atmosphere which is having a fluctuation character so, studying of variation in Electromagnetic Waves, Electric field and Magnetic field along with atmospheric radiant temperature through the short Temporal Resolution satellite can give us an idea to develop a strategic Earthquake Prediction System which will be Real Time.

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