

Observation of Lithosphere-Atmosphere-Ionosphere Variability during Japan Earthquakes

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ABSTRACT

Present study verified the lithosphere-Atmosphere-Ionosphere variability by using the satellite and ground based data sets of Japan earthquakes. During tectonic activity greenhouses gases release such as methane (CH₄), nitrous oxide (N₂O), water vapor (H₂O) and carbon dioxide (CO₂) which can absorb the certain wavelength of Outgoing Long-wave Radiation (OLR and adding more heat into the atmosphere. NOAA gridded satellite data are observed these local anomalies along the large linear fault system. Ionization of greenhouses will also take place and generated modulated anomalous waves which propagate into the ionosphere F region. Significance of present study shows that multi-parametric analysis is necessary to predict the earthquakes to save human lives in the prone regions.

Key words: Lithosphere, Atmosphere, Ionosphere, NOAA, Ionization.

List of Selected Earthquakes

S.No	Earthquake	Date	Location	Magnitude	Depth
1	Kuril Island,(Japan)	15/11/2006	46.6°N, 153.3°E	8.3	30.3 km
2	Izu Island ,(Japan)	09/08/2009	33.1°N, 138.0°E	7.1	29 km
3	Ryukyu Island ,(Japan)	26/02/2010	25.9°N, 128.4°E	7.0	22 km
4	Tohoku,(Japan)	11/03/2011	38.2°N, 142.3°E	9.0	30 km

Methodology

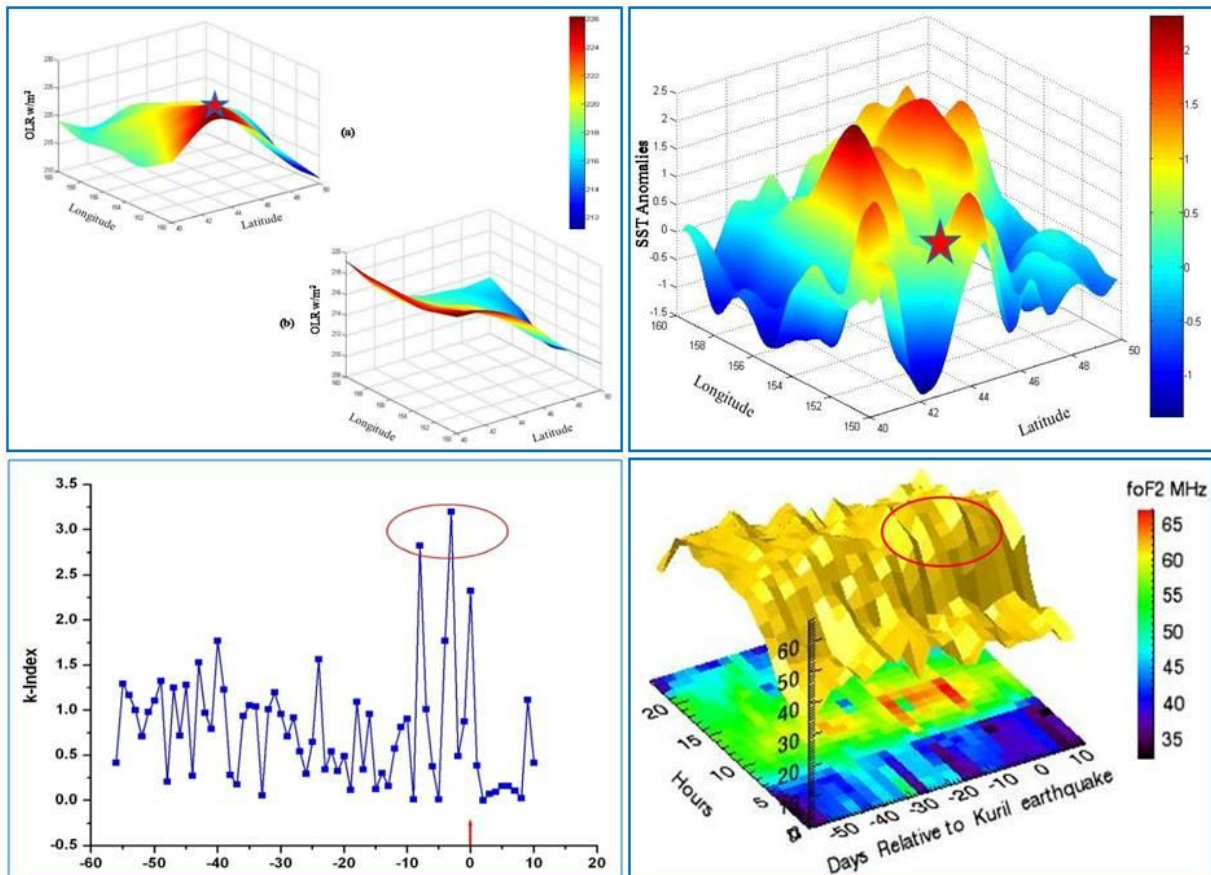
Eddy Field calculation mean method is applied to calculate the atmospheric disturbances associated with selected earthquake.

$$S_a^*(x_{ij}, y_{ij}) = 4 \cdot S(x_{ij}, y_{ij}) - [S(x_{i-1}, y_{ij}) + S(x_{ij}, y_{j-1}) + S(x_{i+1}, y_{ij}) + S(x_{ij}, y_{j+1})]$$

$$\text{OLR Anomaly} = \frac{\text{OLR current value} - \text{Multi year mean data}}{\text{Standard Deviation}}$$

Kuril Island,(Japan)

Results



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