



## **Statistical Analysis of Very Low Frequency Electromagnetic Signal for Earthquake Precursor Anomalies**

Chun-Hsiang Chan (1), Tzu-How Chu (1), and Protty Jiun-Huei Wu (2)

(1) Department of Geography, National Taiwan University, Taiwan, (2) Department of Physics, National Taiwan University, Taiwan

Among various disasters in the world, earthquake disasters always destroyed lots of properties and lives immediately; however, it is difficult to know the epicenters, magnitudes and time information beforehand. In this study, we collected very low frequency electromagnetic (VLF-EM) signal data from April 2016 to May 2016 in the Taipei station, and all earthquake events in this period were from the Central Weather Bureau (CWB) earthquake database. In order to confirm the anomalies, whether those were generated by the earthquakes or other factors, weather data were collected for signal validation before the signal processing of VLF-EM signals. This study applied two thresholds for anomaly detection, of which one was the upper threshold and the other was the lower threshold. Thus, we defined the smoothing average  $\pm 2$  standard deviations as thresholds for anomalies (C.L. = 95%). To sum up, the results showed that the anomalies we obtained were highly correlated to earthquake events in different resolution analysis, in addition, we might apply this way to do further researches between the amplitudes of the signals and the energy of earthquake events.

Keyword: Very Low Frequency Electromagnetic Wave, Signal Analysis, Correlation Analysis