

Characteristics of ULF anomalies associated with the 1999/05/12 Kushiro and 2007/08/15 Peru Earthquakes

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Recently, we have many reports on electromagnetic phenomena associated with earthquakes. From the previous research, the magnetic station should at least be located within the distance of 100km from the epicenter to detect ULF anomalies for earthquakes with a magnitude greater than 7.0 (cf. Hattori et al., 2006).

We analyzed ULF (from 6.6mHz to 100mHz) magnetic data of two earthquake events, and investigated whether there is a magnetic peculiar change associated with earthquakes or not. These data were obtained from Magnetic Data Acquisition System (MAGDAS) and the Circum-pan Pacific Magnetometer Network (CPMN) stations.

From the case study of the 1999/05/12 Kushiro (Geo. Lat.=42.95N, Geo. Lon.=143.91E) earthquake with magnitude $M=6.4$, we found a peculiar increase of H-component power ratio AR/AM of magnetic pulsations a few weeks before the earthquake, where AR is the power obtained at Rikubetsu (RIK: 43.48N, 143.76E) station ($r=61\text{km}$) near the epicenter and AM is the power obtained at a remote reference station, Moshiri (MSR: 44.37N, 142.27E, $r=205\text{km}$). It is also found that the H-component power ratio AD/AY of Pc3 increased three times just a few weeks before the earthquakes and after one week decreased to the normal level, where AD is one-day power at RIK and AY is the one-year-average power.

On the other hand, from the case study of the 2007/08/15 Peru (-13.35N, -76.50E) earthquake with magnitude $M=7.9$, we did not find a peculiar change before and after earthquake at Ancon (ANC: -11.77N, -77.15E) station. The reason must be because the ANC station is far from the epicenter of the earthquake ($r=189\text{km}$).

In order to establish the above conclusions, we need to analyze more events and must show statistical results.

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