

1983～2018年の柿岡観測点におけるULF磁場の異常変動と地震との相関に関する統計解析と地震前兆性の評価

Evaluation of ULF seismo-magnetic precursor phenomena at Kakioka, Japan over 1983 –2018 by using SEA and Molchan' s error diagram

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To clarify and verify the ultralow frequency (ULF) seismo-magnetic phenomena, we have performed statistical studies on the geomagnetic data observed at the Kakioka (KAK) station, Japan, during 1983-2017. We investigated the energy of ULF geomagnetic signals of the frequency around 0.01 Hz using wavelet transform analysis. To minimize the influences of artificial noises and global magnetic perturbations, we used only the geomagnetic data observed at midnight time (LT 2:30 A.M. to 4:00 A.M.). We define the geomagnetic anomalies when the Z components of geomagnetic data exceeds median + 1.5 IQR, where IQR is the interquartile range. Considering that ionospheric disturbances may also lead to enhancements in the Z component, we exclude the anomaly when the energy of H component exceeds median + 3.0 IQR. Statistical analysis of superposed epoch analysis have indicated that ULF magnetic anomalies are more likely to appear before sizable isolated earthquake events ($E_s > \text{-----}$ and no earthquake events during ± 45 days) rather than after them, especially 6-10 days before the events. Finally, we have evaluated the precursory information of ULF geomagnetic signals for local sizable earthquakes using Molchan' s error diagram. The results show that the ULF seismo-magnetic phenomena at Kakioka clearly contain precursory information and have a possibility of improving forecasting of large earthquakes. The details will be given in the presentation.

キーワード：地震前兆現象、統計的有意性、Molchan's Error Diagram Analysis

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