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Statisyical study of ULF magnetic phenomena associated with earthquake in Kanto, Japan

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In order to investigate the ULF seismo-magnetic phenomena, a sensitive geomagnetic network has been installed in Kanto, Japan. In this study, we have analyzed geomagnetic data observed in Izu and Boso Peninsulas during 2000 and 2010. Energy of ULF geomagnetic signals at the frequency around 0.01Hz has been investigated by wavelet transform analysis. To indentify anomalous changes in ionospheric disturbances, the station Memabutsu has been chosen as a reference station in this study. Case studies of magnitude 6 class earthquakes have demonstrated that there are unusual geomagnetic energy enhancements in vertical component before the main shocks. Statistical studies by superposed epoch analysis (SEA) have indicated that before a sizeable earthquake there are clearly higher probabilities of ULF anomalies than that after the earthquake: statistical results of daily counts were found significant at about $3 \sim 4$ weeks before, one week before, few days before and one day after the event for Seikoshi (SKS) station in Izu and around two weeks before, few days before, and one day after the event for Kiyosumi (KYS) station in Boso, respectively.