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Long term analysis of geoelectric potential differences and geomagnetic data observed at Izu and Boso Peninsula, Japan

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In order to investigate the relationship between electromagnetic phenomena and crustal activity, the sophisticated geoelectric potential difference and geomagnetic fields measurement are realized in the southern part of Kanto Plane since February, 2000. Especially, small array observation with intersensor distance of 5 km is established in Izu and Boso Peninsulas. The frequency range is ultra-low-frequency (ULF; $f < 1$ Hz). The ULF geomagnetic anomalous changes associated with the crustal activity have been reported based on the polarization analysis, which is spectral density ratio between horizontal and vertical components, principle component analysis so far.

In this paper the electromagnetic environment near the station is investigated over long term period. That is, we would like to know the background behavior of the observed data. We investigate view points from electromagnetic environment at the station; (1) the variation of polarization (spectral density ratio between horizontal and vertical of ULF geomagnetic fields) and regional seismic activity, (2) the variation of the preferred orientation of geoelectric potential data, (3) the variation of transfer functions, and (4) the variation of MT impedance. The relationship between polarization and regional seismicity shows that there seems to be a threshold of seismic energy at the site and it is concerned with enhancement of polarization.