



ULF electromagnetic signature possibly generated under the ground

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The southern part of Kanto District, Central Japan is situated in front of the triple junction of three plates (Pacific, Philippine Sea, and Eurasia), and the tectonic activity associated is remarkable. In order to investigate the electromagnetic phenomena associated crustal activity, the precise ULF electromagnetic measurement network has been established. At each station, three magnetic components and two horizontal electric components are observed. There are two arrays with interstation distance of 5 km in Izu and Boso Peninsulas. In this paper, the features of interstation transfer functions (ISTF) have been investigated. ISTF means the correlation between the site and the reference site. Kakioka operated by Japan Meteorological Agency is used for estimating transfer functions in this paper. We investigate the temporal variation of ISTFs and perform global noise reduction using estimated magnetic fields by ISTF at the sites. Usually FFT is used for estimating transfer function but wavelet transform is applied in this paper.

We analyzed data observed at Boso stations. Near the Boso stations, there are two slow earthquake events in 2002 and 2007. The findings for the 2002 Boso slow earthquake are as follows. (1) There are some interesting signals which seem to originate from the fluid flow under the ground taking account of the polarity of magnetic field components. (2) The characteristics of the observed signals are different from the normal stage. (3) FDTD simulation indicates the source region should be shallow (about a few km depth). For the 2007 slow earthquake event, there are no clear changes observed in the period of the 2002 event but one month after the event, the similar signals are captured. These facts suggest that there is a possibility of existence of underground channel of fluid flow.