



ULF electromagnetic transfer function analysis using the wavelet for monitoring of crustal activity

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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) between magnetic and/or electric components have been investigated to understand electromagnetic property associated with crustal activity. Usually FFT is used for estimating transfer function but wavelet transform is applied in this paper. As a mother function, Morlet wavelet has been chosen for the wavelet transform. As a reference station, Kakioka operated by Japan Meteorological Agency is used for estimating transfer functions.

The main results for magnetic transfer function are as follows. (1) During analyzed periods (2000-2003), there are some large earthquakes occurred associated with Izu Islands Earthquake Swarm in July – August, 2000. The induction arrows of vector length and their direction from the southward. Especially, the clear anomalous changes in July. It is safe to say that the direction of the induction arrow vector is unusual just before and in the period of the swarm activity. (2) There are anomalous changes of ISTF possibly associated with earthquakes with $M > 4$ occurred within 100 km distance between epicenter and sensor.