Monitoring of geomagnetic transfer function(interstation transfer function) variation with using wavelet transform

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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.

In this paper, the variation of the magnetic transfer functions is investigated from Feb. 2000 to Dec. 2003 at stations at Izu Peninsula.

The main results monitoring of horizintal ISTF transfer functions are as follows:

(1) The variations of horizontal ISTF at Seikoshi and Mochikoshi are quite similar.

(2) The variation of horizontal ISTF has a tendency to change associated with the large change of the local strain variation during analyzed periods (Feb. 2000- Dec. 2003) at Seikoshi and Mochikoshi stations at Izu Peninsula. Two of them, there are seismic activity near stations; one is 2000 Izu Islands earthquake swarm and the other is 2001 Shizuoka-Chubu earthquake (M5.1).

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