

Long-term changes in the conductivity anomaly transfer functions at Japanese Magnetic Observatories (second report)

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Utilization of the 100-year data of Kakioka Magnetic Observatory may open many new fields of geomagnetism researches. Among these, the long-term change of the geomagnetic conductivity anomaly (CA) transfer functions deserves to be analyzed because it may tell us important information about relationship between the geomagnetic change and the crustal activity including earthquakes [Yanagihara, 1972].

The preliminary report about the long-term changes in CA transfer functions at Kakioka and other two geomagnetic observatories operated by Japan Meteorological Agency was presented in the Fall Meeting of SGEPPSS. In the report, long-term tendency of decreasing A_u at Kakioka obtained in the 1976-1988 data [Fujita, 1990] is still continuing, but the rate of decrease becomes smaller in the period of 1976-2011. In addition, no remarkable changes in CA transfer functions were detected before the 2011 Off the Pacific Coast of Tohoku Earthquake. This fact casts a doubt about the remarkable changes of the CA transfer functions at Kakioka before and after the 1923 Kanto Earthquake [Yanagihara, 1972].

In spite of the negative report about relation between changes in CA transfer functions and occurrence of a large earthquake, it seems theoretically reasonable that crustal changes yield a certain variation in the CA transfer function. Thus, it is important to study how much the CA transfer function changes due to crustal changes. To tackle this problem by using geomagnetic data, we need to discriminate between changes of the CA transfer functions from the magnetospheric and ionospheric currents and from crustal changes by using a multi-point and long-term data. For this purpose, data from Kakioka, Memambetsu and Kanoya are idealized sets of data.

In the report, we will present seasonal variations of CA transfer functions and relation between the CA transfer functions and several factors like amplitude of disturbances. It is our target to obtain the change of the CA transfer functions derived solely from the crustal changes.

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Keywords: long-term variation of CA transfer function, Magnetic Observatory, co-seismic change