

Geoelectric Potential difference observation conducted by Kakioka Magnetic Observatory

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Kakioka Magnetic Observatory, Japan Meteorological Agency, has measured the geoelectric potential difference continuously since 1930's at Kakioka and 1950's at Memambetsu and Kanoya. The measurement is sometimes addressed as an Earth current measurement, however what has been measured is a voltage difference between two electrodes at the Earth's surface. The electrodes and their locations were changed several times. At present, we use a pair of copper plates or carbon rods as the electrodes and separate them 100 - 300m each other. Two pairs of electrodes are placed in the north-south and east-west directions at each observatory and the two horizontal components of the voltage difference are measured every 0.1 second.

The geoelectric potential difference measurement for a long term is rather rare. In addition, the geomagnetic field is simultaneously measured in our case, which makes investigations of conductivity structures, geomagnetic sudden changes, and crustal activity possible. Use of the geoelectric potential difference data is expected to be boomed because a data download service through the observatory HP started in the end of 2012 and data accessibility has been improved.

I will introduce observation systems and characteristics of our geoelectric potential difference measurement in my presentation. Site differences among Kakioka, Memambetsu, and Kanoya will be focused and the relationship with the local conductivity structure will be speculated. For instance, a heterogeneity of the voltage difference at Kakioka, which has been known for years, will be considered if a modern spectral analysis technique and a modeling method may add new information.

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