Principal Component Analysis of ULF Electromagnetic Data

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Many electromagnetic phenomena associated with crustal activities have been reported in a wide frequency range from DC to HF. In particular, ULF electromagnetic phenomena are one of the most promising because of the deeper skin depth. Observed ULF electromagnetic data on the ground are superposition of several kinds of signals; change associated with solar-terrestrial interaction, human activities, crustal activities, and so on. Spontaneous changes such as magnetic storm and precipitation are also registered and they are intense. In order to identify the crustal activity-related variation, detection of intense changes and discrimination are important.

In this paper, principal component analysis has been performed for Kiyosumi data in Japan to detect the spontaneous changes associated with precipitation and magnetic storm automatically. The result will be present in the session.