Abstract Details

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Title: (IWG2) Possible Electromagnetic Phenomena Associate with 2002 Boso Slow Earthquake, Japan

Abstract:

Despite its extreme importance and years of effort, practical short-term earthquake prediction still remains to be achieved in future. However, earthquake-related electromagnetic phenomena are recently considered as a promising candidate for short-term earthquake prediction. There have been accumulated a lot of evidences of precursory signatures in a wide frequency range (DC-VHF). The ULF geomagnetic change is one of the most promising phenomena. We have installed the ULF geoelectromagnetic station network in Kanto-Tokai area, Japan. There are two geomagnetic sensor arrays with inter-sensor distance of about 5 km in the Boso and Izu Peninsulas. Both regions locate at one of the most active seismic zones in Japan. Torsion-type magnetometers with three components are in operation and two horizontal electric potential differences are measured by pairs of electrodes with distance of 50 ? 100 m. All of equipments are synchronized using GPS clock. The sampling rate is 50 Hz, but we use the data resampled down to 1 Hz in this study. Because we removed the geomagnetic pulsation effects from observed data by means of the interstation transfer function approach with using data at the Kakioka Magnetic Observatory (JMA) which is 1 Hz sampling rate. In this paper, we analyzed data obtained at stations (KYS, FDG, UCU) in the Boso Peninsula possibly associated with the slow earthquakes in October, 2002. The clear anomalous signals appear both in magnetic and electric field simultaneously. The apparent active day was October 6, 2002. It is the day when small swarm activity started in the vicinity of the slow earthquake region. The anomalous signals are transient ones, which seem rectangular shape with 1 Hz sampling rate. We found interesting variation in the polarity of magnetic fields in October 6. Polarities for horizontal components are common in three stations but that for vertical, has a time dependence as follows. At the stage 1 (01:00 - 01:29 JST), no apparent anomalous signals appear but small changes have the same polarity among three stations. At stage 2 (01:29 - 01:36 JST), it corresponds to the starting of small swarm around the slow EQ area, only data at KYS show negative change, the data at other two (UCU and FDG) show: positive anomalous changes. In this interval, 5 clear signals generate with duration of some tens seconds. At the stage 3 (01:36 - 02:00 JST), anomalous changes at KYS, UCU, and FDG have a same positive polarity. These experimental facts suggest electro-kinetic effects take important role. We will show you the detailed characteristics of observed signals

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