

Study of pre-seismic ionospheric anomalies in the D region using the DEMETER burst data

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We statistically investigate pre-seismic ionospheric disturbances by using the VLF electric field data of the DEMETER, following Nemeč et al. (Geophys. Res. Lett., 2008; J. Geophys. Res.; 2009) and Pisa et al. (J. Geophys. Res., 2013). Our replicated analysis also showed that the background intensity of around 1.7 kHz electric field decreased within 4 hours before the mainshock with magnitude of more than 4.8, using the complete data set of the DEMETER, i.e., 6.5-year. In order to understand the physical mechanism of the depression of the background intensity, we selected orbit highly related to the decrease of the intensity for the event analysis from the whole data. We analyze the burst mode data of the VLF data in detail.

Keywords: Earthquake, Subionospheric disturbance, DEMETER

## First observational results of electromagnetic wave detection system in VLF range, Tokai University

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It has been well known that the preseismic VLF pulse-like electromagnetic signals sometimes increases a few days before the sizable earthquakes especially in-land earthquakes. Almost two decades ago, Tokai University group developed a digital recording system and published remarkable results. However, at the time, due to the limitation of personal computer's data storage and CPU power, they quitted the observation. Therefore, we would like to re-start the research by using current technology. Fortunately, What we call "Japanese National Earthquake Prediction Project" decided to support our proposal. This is a preliminary report of the development of the new observation system. The system has a 12 bits A/D converter and 100MHz sampling capability. We can determine locations of signal source not only direction finding method but also time of arrival (TOA) method.

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