

Design of VHF interferometer at Chiba University

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Several studies have been reported that earthquake-related anomalous electromagnetic phenomena in broad frequency range in these decades. The anomalous propagation of VLF and/or VHF transmitter waves are considered as one of the most promising approaches to the short-term prediction and the monitoring of seismic activity. The anomalous propagation is considered by means of the ionospheric or the atmospheric disturbances for some reasons in above near the epicenter before large earthquakes; in the case of VLF transmitter waves, significant changes occur in amplitude, phase, and other parameters. It is due to the change of electron density in the lower ionosphere. In the case of VHF transmitter waves, the over-horizon propagations were detected. It is caused by scattering in the atmosphere. We monitor these changes in medium by using the radio remote sensing techniques. We deal with the detection and/or monitoring of atmospheric disturbances with use of the VHF transmitter waves in this study.

Fujiwara et al.(2004) reported that the cross-correlation between the earthquake occurrences and the anomalies shows that the appearance of anomalies was significantly enhanced within 5 days before earthquakes (magnitude more than 4.8). However, the direction of arrival of the signals is not clarified so far.

Therefore, we developed VHF interferometer system. It is set up at the Chiba University (Nishi-Chiba campus). The target station is FM Sendai radio station, emitting horizontally polarized 77.1 MHz (5 kW). The distance between the receiver and the transmitter is approximately 300 km that is over-the-horizon length. We will show you our preliminary results.

Reference

Fujiwara, H., M. Kamogawa, M. Ikeda, J. Y. Liu, H. Sakata, Y. I. Chen, H. Ofuruton, S. Muramatsu, Y. J. Chuo, and Y. H. Ohtsuki, Atmospheric anomalies observed during earthquake occurrences, *Geophys. Res. Lett.*, 31, L17110, doi:10.1029/2004GL019865, 2004.