

Interferometric Observation of VHF Radio Waves

Nozomi Ohno[1]; Katsumi Hattori[2]; Toshiaki Takano[3]; Isao Yamamoto[4]

[1] Geosys. and Biosys. Sci. Div., Graduate School of Sci. and Tech., Chiba Univ.; [2] Chiba University; [3] Graduate School of Sci. and Tech., Chiba Univ.; [4] Dept. ICE, Okayama Univ. Sci.

Earthquake-related anomalous electromagnetic phenomena have been reported in various frequency ranges in a few decades. The anomalous propagation of the VLF/VHF transmitter waves is one of the most promising approaches on the short-term prediction and crustal activity monitoring. The anomalous propagation is considered to be generated by as disturbances of the ionosphere / atmosphere in some reasons above the epicenter or along the propagation path before large earthquakes. Consequently, significant changes occurred in amplitude, phase, and other parameters of VLF transmitter waves. On the other hand, for VHF transmitter waves, over-horizontal invisible propagation was received. Recent studies on the cross-correlation between the earthquake occurrence and the anomalies shows that the appearance of anomalies was significantly enhanced within 5 days before earthquakes (Magnitude more than 4.8). However, it has not been clarified about the direction of wave arrival.

The purpose of this study is to design an interferometer system for VHF radio wave and to identify the position between space-time of earthquake precursory atmospheric disturbance. Therefore, we developed interferometer finding direction system at the Chiba University (Nishi-Chiba campus). The target FM radio station is located in Sendai and the frequency is 77.1 MHz with horizontally polarization (5 kW). The distance between the receiver and the transmitter is approximately 300 km that is over-horizontal range. In order to improve accuracy we set up the narrow band-pass filter and pre-amplifier. We will show you preliminary results in the presentation.

References

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