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VHF interferometry system for anomalous propagation of FM radio broadcasting wave and its preliminary result

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Earthquake-related electromagnetic phenomena have been reported in various frequency ranges in a few decades. There are a lot of observation methods of the earthquake-related phenomena. Active sounding using VLF and VHF radio transmitter is one of the popular methods. Anomalous propagation is registered prior to the large earthquakes. The over-horizontal propagation is considered to be generated by disturbances of the atmosphere above the epicenter or along the propagation path. A recent study shows that the appearance of anomalies was significantly enhanced within 5 days before earthquakes with M more than 4.8. However, there is no information on the scattered place.

In this study, a simple interferometer system for VHF radio wave to identify the source position between space-time of earthquake-related atmospheric disturbances has been developed and installed at Chiba University (Nishi-Chiba campus). The target FM radio station is located in Sendai and the broadcasting 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 this presentation, evaluation of this system and a characteristic of the VHF radio wave propagation will be report.