

## An Attempt to Observe Environmental EM Noise Using VHF Log Periodic Dipole Arrays

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### 1. Introduction

Electromagnetic phenomena preceding earthquakes have been observed at a wide frequency range from DC to VHF band. Hence, electromagnetic (EM) pulses including various frequency components should be observed. The VHF log periodic dipole arrays were chosen to measure the pulse shapes since they have relatively uniform characteristics in their gains and in directivity response patterns at a wide frequency range, from 90 M to 220 MHz.

### 2. Observation

The observation station is Toyonaka Campus, Osaka University (Toyonaka City, Osaka Prefecture: 34.46N, 135.28E). Two antennas facing horizontally to the west and to the zenith were installed to determine the coming direction of EM pulses. The pulse shapes of the two antennas were saved directly using a digital storage oscilloscope (DSO) with time codes when either pulse height exceeds the specified trigger level.

### 3. Analysis

Derived pulse shapes are divided into several types. Their daily and weekly fluctuations were analyzed correlating with other data such as meteorological conditions, thunderstorms and geomagnetic storms. The possible preseismic EM signals were investigated by correlating the occurrence of EM pulses with that of nearby large earthquakes. The relationships with activity of catfish, which have sensitive electrosensory organs, were also examined to prove that unusual behavior of catfish is caused by EM pulses.