

Electromagnetic observation addressed to the short-term earthquake prediction research in VLF band

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There have been many reports electromagnetic (EM) waves preceding earthquakes have existed since the 1980s. The late Professor Toshi Asada and his colleagues focused on the VLF band and developed devices and made observations at the Tokai University in the 1990s. As a result, in the apparent arrival direction analysis, the electromagnetic waves, which comes from the epicenter direction were observed. However, after that, the observation was interrupted due to the death of Professor Asada. It seemed promising results, therefore we resumed research from FY 2014. The feature of the present apparatus is that not only the apparent arrival direction analysis but also the wave source determination can be performed using the time difference of arrival (TDOA) of EM waves. Because the apparent arrival direction method can only apply when the observed EM wave has a linear polarization. In the wave source determination using TDOA, the arrival time of the EM wave was determined by using the autoregressive model and AIC. We observed EM waves coming from the epicentral region, two days before the earthquake, which occurred in the southern part of Nagano Prefecture on June 25, 2017 (M5.6). This earthquake was the largest one occurred in the vicinity of our observation network at this moment. In the presentation, we would like to present a detailed waveform analysis and future research plan.

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