

Study for earthquake prediction by detections of electromagnetic pulses in the earth

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So far we could not find electromagnetic (EM) pulses generated by earthquakes. However, we have found that high frequency (a few kHz) components of EM waves would decay due to high electrical conductivity during their propagations in the earth medium, and that EM waves in the extremely low frequency range (0-25Hz) could be detect.

In the observation at Kyoto Sangyo University, during the period of 13 months from December 20, 2011 to January 25, 2013, we found EM pulses clearly for ten earthquakes among thirteen ones with magnitude of $>M2$ occurred within a circle region of radius of 40 km centered at the EM observation site. In this case, EM pulse detection is affected by the electrical conductivity of the land.

On the other hand, we found, from the data of EM pulses related earthquakes, that we detected these EM pulses which might be excited by the wave front of the propagating seismic wave in the crust near the EM observation site. Therefore, a waveform of detected EM pulse might include multi-EM waves radiated from various place along the propagation path of the seismic wave.

For earthquake prediction, we need to clarify the mechanism of the waveform formation of the detect EM pulses. For this purpose, we need to observe EM pulses in deeper earth (at about 1 km depth).

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