

## Electromagnetic field fluctuations recorded in MT data during the eruption of Kirishima Shinmoe-dake in 2018

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Shinmoe-dake is an active volcano located in the center of Kirishima volcanic area in Kyushu. In January 2011, magmatic eruption occurred for the first time in about 300 years, and erupted again in October 2017 and March to June 2018. In this study, we discuss the relationship between electromagnetic signals obtained by broadband MT (magnetotelluric) observation and seismic and infrasound data close to the Shinmoe-dake volcano.

Twenty eruptions during March to June 2018 were selected for an analysis. We use the MT data recorded at two sites ((1) 5.1 km NW of the Shinmoe-dake crater, and (2) 3.2 km WSW of the Shinmoe-dake crater) and a seismic and infrasound observations data recorded at 30 m away from (1) MT site. We obtained MT time series data with physical unit (mV/km, nT) by applying a Fourier transform, incorporating the frequency responses of instruments and inverse Fourier transform. We also got time series data of physical units ( $\mu\text{m/s}$ , Pa) from seismic and infrasound data.

At (1) MT sites, the electromagnetic signals of explosive eruptions well synchronized with the seismic vertical motions and infrasound data. The shape of the impulsive compression phase of infrasound data looks very similar to the shape of EM variation at that time. We also conclude that the EM signals are not occurred in the crater but occurred at the area very close to the MT observation sites.

We will carefully investigate the relationship between electromagnetic signals and seismic and infrasound data close to the Shinmoe-dake volcano and discuss why the seismic and infrasound generates electromagnetic variations.

Keywords: electromagnetic signal, explosive eruption, infrasound, seismic motions, Shinmoe-dake