

Spectral characteristics of volcanic earthquakes before and after the 2014 eruption of Ontake volcano

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Ontake volcano started phreatic eruption on 27 September 2014. The volcanic earthquake activity began from 29 August preceding the eruption and increased remarkably during 10-11 September. However, the volcano showed the decrease of earthquakes after that, followed by the phreatic eruption. We investigated the spectral characteristics of volcanic earthquakes with a view to reveal the eruptive process before the eruption implied by the earthquakes.

We classified the volcanic earthquakes occurred at Ontake volcano based on the spectrum of vertical record at Tanoharaue seismic station (JMA) into two groups defined as follows; earthquakes containing high frequency component over 20 Hz called HF, and otherwise called LF.

Comparing the activity of two groups before and after the eruption, LF was dominant for about a month before the eruption. In contrast, HF comprised a majority for about a month after the eruption. The duration of each LF earthquake was relatively long before the eruption, but became short after that. HF showed little difference about the duration between before and after the eruption. A number of successive volcanic earthquakes occurred before the eruption, and the majority of those had LF characteristic, however decreased after the eruption.

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