

BP-type and BT-type volcanic earthquakes in Azumayama

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At Azumayama located on the prefectural boundary between Yamagata and Fukushima prefectures, volcanic tremors occurred on 22 July 2018. Changes in tiltmeter data from Joudodaira Station (around 1 km ESE of the Oana crater) indicated ground deformation with a remarkable rising trend in the direction toward the crater. Volcanic seismicity has mostly remained at high levels since August 2018, and volcanic activity has remained at high levels. Japan Meteorological Agency (JMA) issued a Near-crater Warning on 13 September and raised the Volcanic Alert Level from 1 (Potential for increased activity) to 2 (Do not approach the crater).

There are mainly three types of volcanic earthquakes in the vicinity of the Oana crater: the BH-type in which the dominant frequency is high, the BL-type in which the dominant frequency is low, and the BP-type / BT-type with the harmonic waveform. These volcanic earthquakes occur roughly at depths of less than 1 km.

From July to October 2018, BH-type earthquakes mainly occurred, and the proportion of BL-type earthquakes and BP-type / BT-type earthquakes slightly increased in November. After that, the proportion of the BL-type earthquakes decreased, but the proportion of the BP-type / BT-type earthquakes further increased. The proportion of the BP-type / BT-type earthquakes to the whole volcanic earthquakes is 25% in November and 50% since December, and it continues high levels. The BP-type / BT-type earthquakes that occurred after July 2018 have various types of characteristics, such as damped harmonic oscillators with a single frequency peak seen in the BP-type / BT-type earthquakes occurred from 2010 to 2011, damped harmonic oscillators with multiple frequency peaks and those with high-frequency earthquake near the beginning of the earthquake, and no systematic change of the dominant frequency can be observed. In this presentation, we introduce what we found as the results of focusing on waveform shape and amplitude ratio for the BP-type / BT-type earthquakes that occurred after July 2018.

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