

Intermittent volcanic tremor activity at Miyakejima volcano during April 2015 –March 2016

*Hiroko Hagiwara¹, Hidefumi Watanabe¹

1. Tokyo Metropolitan Government

Volcanic tremor is considered as a seismic signal generated by complex interactions of magmatic fluids with surrounding rocks, so that it provides clues to understand underground volcanic situations. Intermittent tremors began to occur beneath Miyakejima volcano in April 2015. After a quiet period of three months, the tremor activities increased in amplitude until December, and then rapidly decreased at the end of December, following with weakened intensity until March 2016. Even during a quiescent stage, volcanic tremor has appeared occasionally, however, this tremor episode shows a very regular and rhythmic pattern. We have investigated the tremor waveforms based on the Izu-Islands volcanic observation system operated by the Tokyo metropolitan government, using a time series and spectral analysis in conjunction with determination of tremor sources. During tremor episodes, the durations of bursts were about 5 min, while the intervals between the beginning of a burst and the onset of the next one were from 15 to about 17 min. The tremor sources were located beneath the crater south rim at a depth of about 1.2 km, where low frequency events were also located. The dominant frequencies of tremors were 3 to 5 Hz, similar to low frequency events. The relationship between the characteristics of the tremor and rainfall and tidal effects implies the involvement of a hydrothermal system under the crater. On the basis of all these results and similarity to a geyser, we propose a conceptual model to interpret this tremor mechanism.

Keywords: intermittent volcanic tremor , Miyakejima, geyser