

Seismic activity beneath Mt. Ontake linked the 2007 and 2014 eruptions

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We developed a portable seismic telemetry system. This system is compact size, and the consumption electricity is small (Horikawa et al., 2017VJSJ). From October 2017 performance test of this system has been carried out in the summit region of Mt. Ontake volcano. 10 seismic observations were installed. We determined seismic activity around Mount Ontake volcano by using those 10 summit observations and the seismic networks of Nagoya University and Japan Meteorological Agency, and obtained station corrections. Most of earthquakes were located beneath the craters of the 2014 eruption, and those depths were close in sea level or were shallower. The seismic activity is almost distributed on a straight line at -1.5km from 0km in depth and spreads through the northeast-southwest direction at around -1.5km (Yamanaka et al., 2018JpGU). Before the 2007 and 2014 eruption, earthquakes occurred at same place linearly, but the depth were 1.0km to -0.6km in 2014, 3.0km to sea level in 2007. This may be considered that some heat source had risen from this area. After the 2014 eruption, seismic activity in the shallow area was active. On the other hand, in the 2007 eruption few shallow earthquakes occurred. (Yamanaka et al., 2019JpGU)

In order to investigate whether there was really no seismic activity deeper than 1.0 km in the 2014 eruption, we applied a matched filter technique to the continuous waveforms from August to November 2014. We used earthquakes linked the 2007 eruption as template events. As a result of the analysis, many deep earthquakes occurred around September 10, 2014. This suggests that at this time some heat sources had risen through almost the same passages as the 2007 eruption.

In August 2010 there were seismic activity beneath the summit of Mt. Ontake. We also analyzed the continuous waveform in August 2010 using the same method and found that a number of deep earthquakes had occurred at this time. This may mean that there was a possibility of an eruption at this time.

Keywords: Mt. Ontake, Seismic activity, 2014 eruption