

Aeromagnetic survey in Shinmoedake volcano after the 2017 eruption

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We've conducted repeatedly aeromagnetic surveys in Shinmoedake volcano by using an unmanned autonomous helicopter after the 2011 eruption events. So far, as we've already reported, we successfully detected a notable change of geomagnetic total intensity just above the Shinmoedake crater. As the pattern of its change is very typical, that is, a pair of an increase in the south and a decrease in the north of the crater, remagnetization has been going on and a rate of its temporal change is decreasing. It may indicate the lava stored in the crater at the previous eruption is gradually cooling by thermal diffusion. On 11th October 2017, Shinmoedake volcano has erupted again which are supposed to be phreato or phreatomagmatic eruptions, although it was not very critical. After that, we've conducted an aeromagnetic survey again. It was a 6th repeated measurement on the same tracks. Following a way of the previous surveys, a flight course of an unmanned helicopter is about 100m above the ground, and an interval of each measure line is also about 100m. A total distance of measurement lines is 26 km. The survey was conducted on 31st October just after the eruption, but geomagnetic total intensity data still show a clear pattern of slightly further remagnetization nevertheless. An amount of volcanic ashes is estimated as 0.3Mm^3 (JMA), while a volume of lava in the crater is about 15Mm^3 (Kozono et al., 2013). Therefore, although we cannot detect a localized anomaly related to this eruption so far, a geomagnetic field change as a whole was not affected by this small eruption and thus it may be still getting cooler.

Keywords: Shinmoedake volcano, aeromagnetic survey, unmanned helicopter