Gravity signals around Shinmoe-dake volcano after its eruption in October 2017

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Shinmoe-dake volcano started eruption on Oct. 11, 2017 and emitted at least several hundred thousands ton volcanic ash. In addition, daily emission of SO2 exceeded 10,000 ton on Oct. 15, 2017. Just after these events, we started gravity measurements around Shinmoe-dake to monitor subsurface transportation of magma. In this paper, we present our results of continuous absolute gravity measurement at Kirishima Volcano Observatory (KVO) and repeated hybrid gravity measurement on the route from KVO to Takachihogawara (3km south to Shinmoe-dake).

Absolute gravity at KVO exhibited rapid decrease of 10 microgals from Nov. 15 to Dec. 10, 2017 and remained virtually constant since then. The spatial pattern of the local gravity revealed 20 to 50 microgal decrease from Nov. 2017 to Feb. 2018.

We shall discuss how magma (or any mass) was transported during our observation period by considering the result of crustal deformation together.

Keywords: Gravity, Shinmoe-dake volcano, Hybrid gravity measurement