

## **Deformation on the lava surface within the crater at Kirishima, Shinmoe-dake volcano, detected by InSAR and PSInSAR**

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Shinmoe-dake in the Kirishima volcano group is located in southwestern part of Japan. In January 2011, eruptive activities started from the Shinmoe-dake crater and resulted in sub-Plinian and Vulcanian eruptions and a rapid accumulation of lava within the crater. GPS and DInSAR data revealed pre-eruptive inflation, co-eruptive deflation, and post-eruptive inflation centered on 5km west of the crater. The eruption phase ceased by the beginning of September, and the post-eruptive inflation also ceased by November 2011. After the 2011 eruption, monitoring by TerraSAR-X have continued. A surface deformation on the lava within the crater after September 2011 revealed a continual shortening of satellite-ground distance even after the end of the main activity. This LOS shortening means uplifts of the lava surface. We estimated the volume increase of the lava after November 2011, using DInSAR processing of TerraSAR-X data, and concluded that the volume increase still continued in January 2013. The volume change rate has decreased with a small fluctuation as an overall trend. PSInSAR and long-term DInSAR results show LOS elongation including a subsidence in the northeast flank of the crater. It is interpreted that the subsidence is caused by deflation of a shallow deformation source located just beneath the crater. Although total amount of effused lava after November 2011 was larger than a volume decrease of the shallow source estimated from the deflation deformation, continual injections from the deeper source can account for the difference. PSInSAR results also revealed that the subsidence ceased in October 2012. It is interpreted that volume of injection and effused lava achieved an equilibrium condition.