

Surface deformation around the Shinmoe-dake crater: Termination of uplift after the 2011 eruption and acceleration of subsidence before the 2017 eruption

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2011 Shinmoe-dake eruption was terminated in September 2011, but continuous uplift had been detected in the crater after that from SAR interferometry. Uplift speed had decayed with time, and it was not detected after the end of 2016. Its temporal change was well explained by the function with two exponential terms, and one component with short decay time almost terminated in 2012. Its decay was roughly similar to that of SO₂ emission (JMA).

On 11 Oct. 2017 (5:34 JST), eruption occurred at the Shinmoe-dake. To investigate surface deformation around the crater, we applied SAR interferometry using ALOS-2/PALSAR2 and Sentinel-1/SAR. Subsidence had been detected in the crater, but it had tended to decay with time. However, subsidence accelerated in July 2017, three months before of the eruption. In this period, SO₂ was not detected (JMA). One of possibilities for this factor might be drain back of the magma, but more investigation is necessary for its conclusion. Furthermore, local uplift around the vent of the 2017 eruption was detected just before the eruption. It suggests that inflation has occurred in the shallow depth just under the vent. After the eruption, inflation around the vent has not been detected, but subsidence is continuing with 18cm/yr.

Keywords: SAR, Shinmoe-dake, deformation