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## Repetition of inflation of Sakurajima volcano

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Explosive activity at Minamidake summit crater of Sakurajima Volcano, Japan began in 1955 and the eruptivity continued for 54 years counting 7900 Vulcanian eruptions. The activity of Minamidake gradually transited to eruptions at Showa crater at eastern flank of the volcano from 2006. The eruptive activity increased step-by-step and 1033 explosive eruptions were counted in 2010. The main magma reservoir of the Sakurajima volcano is located at a depth of 10 km near the centre of Aira caldera, northern part of the Sakurajima and it is estimated that magma of 140 million m<sup>3</sup> have been stored in the reservoir since 1993 from extensional baseline observed by GPS. Explosive activity at Showa crater remarkably jumped up in October 2009. The eruptive activity from October 2009 is divided into 2 periods; inflation of volcano (October 2009 ? May 2010) and deflation (June ? November 2010). In inflation stage, a lot explosive eruptions occurred (907 events). The inflation was accelerated due to inflation of Aira caldera and migration of magma toward northern part of Sakurajima during January-March 2010. Explosive eruptions also occurred in deflation stage; however discharge rate of volcanic ash was less than inflation stage. Intrusion rate of magma was calculated from tilt change and weight of volcanic ash ejected. In inflation stage, magma intruded into Sakurajima from Aira caldera (0.4 million m<sup>3</sup>/month) and excess magma was ejected by explosive eruption. In deflation stage, intrusion rate decreased (<0.1 million m<sup>3</sup>/month) and magma stored in inflation stage was consumed by eruptions. At the end of November 2010, the deflation turned to inflation again. The deflation was revealed by extension of the ground at Harutayama (northwest of the central cones) and tilt change of crater-side-up at north and northwest flank. Tilt vectors indicate that center of inflation is located at north flank of Sakurajima. Associated with inflation of the ground, concentration of CO<sub>2</sub> from hot spring increased in observation well at Kurokami (4 km east of Showa crater). The number of explosive eruption increased and 95 explosive eruptions were recorded in January 2011. This suggests that magma intruded into Sakurajima from northern part with minor inflation of northern part and magma smoothly moved to Showa crater, increasing explosiveity at the crater.

Keywords: Sakurajima, ground deformation, intrusion magma