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'Understanding volcanoes and society: the key for risk mitigation'



Volcano tectonic earthquake swarm with a large ground deformation from 15 to 16 August 2015, caused by dyke intrusion into Sakurajima volcano.

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Sakurajima volcano, located at the SW edge of Aira caldera in southern Kyushu, Japan, is one of the most active volcanoes in the world. The Summit crater of Minamidake, the southernmost peak of Sakurajima volcano, has erupted repeatedly since 1955. The Showa crater, located at the eastern upper flank of Minamidake, resumed its eruptive activity in 2006 after 58 years of quiescence. It has been extremely active since 2008. From 15 to 16 August 2015, volcano tectonic earthquake swarm occurred beneath Sakurajima almost simultaneously with a large ground deformation indicative of the inflation of the volcanic edifice. It is estimated these were caused by a dyke intrusion beneath the summit area of the volcano. The dyke intrusion seems to have occurred at the depth from 1 to 3km below sea level. The Japan Meteorological Agency (JMA) issued the Residential-area Warning and raised the Volcanic Alert Level from 3 to 4 on the scale of 5. However, no notable increase in eruptive activity followed at the active craters. According to previous studies on magma supply system of Sakurajima, magma in deep (-10km) reservoir beneath Aira caldera repeatedly moves to a shallower (3-6km) reservoir, and subsequently it was expelled from the craters mentioned above. The rate of magma supply is about $3 \times 10^4 \text{m}^3/\text{day}$ on the average since 1914 (Kyoto University, 2013), but it suddenly increased to $106\text{-}107 \text{m}^3/\text{day}$ (Kyoto University, 2015) during 15 and 16 August 2015. It is surmised that the magma intruded into somewhere that is not connected to the surface of the volcano. In order to understand eruption dynamics and improve timely evaluation, discussion is welcome about the ground deformation and earthquake activity related to this intrusion episode.