

Repetitive sulfur dioxide flux measurements between and after the 2014 and 2015 eruptions of Kuchinoerabujima volcano, Japan

TOSHIYA MORI^{1*}, MASAOKI MORITA¹, MASATO IGUCHI², FUKUOKA REGIONAL HEADQUARTERS (JMA)³

¹Geochemical Research Center, Graduate School of Science, The University of Tokyo, Tokyo 113-0033, Japan, mori@eqchem.s.u-tokyo.ac.jp

²Sakurajima Volcano Research Center, Disaster Prevention Research Institute, Kyoto University, Kagoshima 891-1419, Japan,

³Fukuoka Regional Headquarters, Japan Meteorological Agency, Fukuoka 810-0052, Japan

Monitoring of volcanic gas flux from volcanoes gives crucial information to understand the conditions of the volcanoes related to degassing activities and the amount of degassing magma at a depth of the volcano. Kuchinoerabujima volcano is on a remote island about 80 km south of Kyushu Island, Japan and is about 15 km northwest of a world heritage Yakushima island. The volcano erupted on 3 August 2014 after 34 years of dormancy. About 10 months later, on 29 May 2015, the volcano re-erupted in a larger scale. An alert level of the volcano was raised to “Level 5 (Evacuate)” soon after the eruption by JMA and all the residents had to evacuate the island for about 7 months until they could finally go back in late December 2015.

After the 2014 eruption, sulfur dioxide flux gradually increased from a few hundred t/day to about 700 t/day. In response to the increase, we built a small easy-operation UV spectrometer system and started to carry out traverse measurements using a regular ferry line between Yakushima and Kuchinoerabujima islands in order to obtain sulfur dioxide flux more frequently.

Soon after we started the sulfur dioxide monitoring at the end of November 2014, the flux suddenly increased to over 2,000 t/day. This sudden increase probably corresponds to inflation of the volcanic edifice observed by GNSS for the same period. After November 2014, the flux mostly ranged between 1,000 and 2,500 t/day with sporadic fluxes over 3,000 t/day until the 2015 eruption. The observed high sulfur dioxide flux strongly suggests degassing of significant amount of magma beneath Kuchinoerabujima volcano and was a signal for the forthcoming eruption in May 2015.