Volcanic gas CO2 flux from Japanese volcanoes

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Volcanic gas is the major source of the Earth's degassing. The CO2 flux by the volcanic gas emission has been estimated with various methods, among them the fluxes obtained by multiplying the measured SO2 flux and the CO2/SO2 ratio of volcanic gases are likely more reliable, as the SO2 flux is the most commonly measured fluxes of the volcanic volatiles. This method, however, includes an important inconsistency that the CO2/SO2 ratios are estimated based on the compositions of the fumarolic gases, which are accessible but whose SO2 fluxes are not large. The major SO2 degassing sources are open-vent degassing volcanoes and the CO2/SO2 ratios should be estimated based on the composition of gases discharged from such volcanoes. By the application of the Multi-GAS techniques, the examples of the composition measurements of the major degassing volcanoes are increasing and I summarize the examples of Japanese volcanoes to estimate the volcanic gas CO2 flux from Japan.

The CO2 flux is estimated based on the time-integrated SO2 flux (Mori et al., submitted) and the CO2/SO2 ratios of volcanic plumes from the major degassing volcanoes in Japan. The time-integrated compilation of the SO2 flux revealed that several degassing volcanoes, including Sakurajima, Miyakejima, Asama, Aso, Satsuma-Iwojima and Suwanosejima, contribute more than 90