

2015 Eruption of Mt. Aso in Japan and its impacts in Air Quality over South Korea

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Aso volcano in Japan erupted at 9:43(local time) on 14 September 2015 with the plume height of about 2,000 m, and the volcanic ash spreaded to the direction of northwest~west from the crater. Synoptic-scale meteorological analysis showed that Korean peninsula had a possibility to be affected by the volcanic ash created from the Mt.eruption.

We carried out simulation of volcanic ash spreading using HYSPLIT model to evaluate the influence of Mt. Aso eruption on Korean peninsula and its surroundings. Most of volcanic ash was trapped below 2000 m AGL height over Jeju-do and the southern region of Korean peninsula and maximum concentration with $4.08 \times 10^{-10} \mu\text{g}/\text{m}^3$ was simulated over Jeju-do in the lowest layer(below 500 m AGL height) after 33 hours. However, this concentration was very smaller rather than other dust and sand storm events such as Asian dust.

We also applied the multi-stage impactor and PM₁₀ instrument for examining volcanic ash emission effect of Mt. Aso eruption on Jeju-do. Size-resolved soluble ions in the aerosol particle by multi-stage impactor were also analyzed. PM₁₀ concentration was not increased sharply at Seogwipo in Jeju-do. The concentration of important inorganic species (NH₄⁺, Na⁺, K⁺, Ca²⁺, Mg²⁺, SO₄²⁻, NO₃⁻, Cl⁻, F⁻, HCOO⁻, CH₃COO⁻, CH₃SO₃⁻) were not varied largely except NO₃⁻ when the species were compared with that of normal day. Therefore, we considered an aerosol species were weakly affected.

We concluded that it is possible that the volcanic ash emitted from Mt. Aso was advected into the Korean peninsula and its surroundings. However, the concentration of the volcanic ash was so small to give a direct or an indirect effects on South Korea significantly.

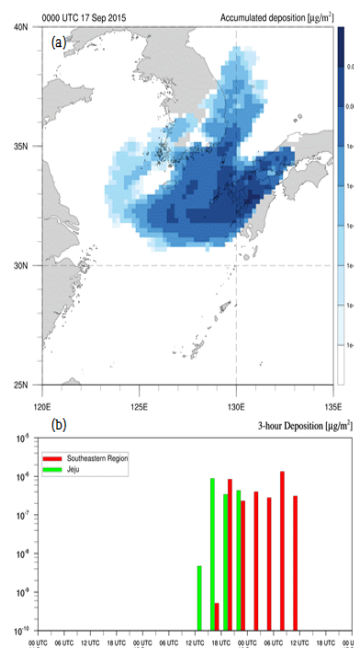


Figure 1. (a) Accumulated deposition amount from 00 UTC 14 to 00 UTC 17 September 2015 and (b) 3-hour deposition amount over Jeju-do(green bar) and southeastern region of Korean peninsula(red bar).

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