Geophysical Research Abstracts
Vol. 17, EGU2015-10597, 2015
EGU General Assembly 2015

Measurements of volcanic aerosols during the Holuhraun eruption in Iceland

Guðmunda María Sigurðardóttir (1), Sibylle von Löwis (1), Baldur Bergson (1), Þröstur Þorsteinsson (2), and Þorsteinn Jóhannsson (3)

(1) Icelandic Meteorological Office, Reykjavik, Iceland, (2) University of Iceland, Institute of Earth Sciences, Reykjavik, Iceland, (3) Environment Agency of Iceland, Reykjavik, Iceland

Measurements of airborne particles have been made with an Optical Particle Counter (OPC) since early September 2014 in the vicinity of the volcanic lava eruption in Holuhraun, N of Vatnajökull, in NE-Iceland. Measurements close to the eruption site were made between 1 – 4 September, 19 September – 1 October, and 3 – 6 October 2014. On 12 September another OPC was installed in Möðrudalur, ∼70 km NE of the eruption site, which has measured since, nearly continuously, the aerosol particle number concentration. The data from both locations, Holuhraun and Möðrudalur, show several particle concentration peaks.

However, since the eruption site is located in one of Iceland′s largest sandy deserts, known for large-scale dust events, it is difficult to distinguish between particles emitted by the eruption or from the sandy area. From the measurements of the SO_2 concentrations in Northern and Eastern Iceland, made by the Environmental Agency of Iceland, it can be seen that enhanced particle number concentrations are correlated with high concentrations of SO_2. This correlation can help to distinguish between particles originated by dust events and those with volcanic origin. The farm Svartárkot, $\sim$ 60 km NV of the eruption site, is frequently affected by dust re-suspended from the sandy desert N of Vatnajökull. OPC data over a two month period in summer 2013 were collected in Svartárkot and will be used for comparison. Using particle size distribution and total particle number, as a function of wind direction, wind speed and precipitation, and comparing it with Möðrudalur and Holuhraun data, enables the particle origin to be estimated.

In addition to the measurements close to the eruption site OPC measurements are on-going in Reykjavík, $\sim$ 260 km SW of Holuhraun, since the 6 October 2014. First comparisons have also shown a strong correlation between increased SO_2 concentration and particle number. Therefore, it may be assumed that these particles are build by gas-to-particle conversion processes. However, data have to be analysed in more detail to verify this assumption.