



Interaction Between the Eruption at Holuhraun and the Ambient Atmosphere

Halldór Björnsson (1), Guðrún Nína Petersen (1), Pordur Arason (1), Elin Björk Jónasdóttir (1), Haraldur Ólafsson (1,2), Melissa Anne Pfeffer (1), Sara Barsotti (1), Bolli Palmason (1), Sibylle von Löwis (1), and Tobias Dürig (3)

(1) Icelandic Meteorological Office, Reykjavik, Iceland (halldor@vedur.is), (2) University of Iceland, Reykjavik, Iceland (haraldur@vedur.is), (3) Earth Science Institute, University of Iceland, Reykjavik, Iceland (tobi@hi.is)

Associated with the unrest in Bárðarbuga, an effusive eruption started at Holuhraun on 29 August 2014 and it is still continuing in January 2015. The eruption produces very limited ash and the eruption plume is a bent over vapour plume that most often reaches 1-3 km above the eruption site. The plume is, however, very dependent on atmospheric conditions such as winds, stability and boundary layer thickness.

The eruption has released large quantities of volcanic gases, mainly SO_2 and CO_2 leading to persistent gas haze, often observed below the water vapour plume and over the active lava field. The eruption takes place in an area that is quite arid for Iceland and a significant source region of re-suspended particles. During re-suspension events dust may be mixed into and carried aloft by the plume, acting as additional cloud condensation nuclei, further enhancing the plume and its structure.

The active lava field warms the atmospheric boundary layer and generates persistent updrafts, leading to the formation of pyrocumulus clouds over the lava field. Furthermore the differential heating from the non-uniform lava field enhances local circulation and thus providing favourable conditions for twisters extending several hundred meters into the atmosphere.