



## Implications of reactive halogen chemistry in tropospheric volcanic plumes

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Bromine oxide has been measured in the plumes of several passively degassing volcanoes. In previous studies we compared field measurements from Mt. Etna, Italy with results from a one-dimensional model that was initialised with volcanic plume compositions according to a thermodynamic model. Assuming a so-called effective source region where plume air is being mixed with ambient air at still high temperatures we were able to reproduce the measurements for BrO and SO<sub>2</sub> very well (Bobrowski et al., 2007). The model resolves the vertical dilution of the plume and includes a parameterisation for the horizontal entrainment of background air as well as a detailed set of gas-phase and aqueous-phase reactions.

This presentation will discuss long-range effects of volcanic plumes on tropospheric chemistry and will address a number of important open questions such as the speciation of chlorine, sulphur - halogen interactions and especially the interaction of halogens with mercury. I will present new model results to help identify the involved processes and implications and to direct future field work.