



Volcanic iodine monoxide observed from satellite

Anja Schönhardt (1), Andreas Richter (1), Nicolas Theys (2), and John P. Burrows (1)

(1) Institute of Environmental Physics, University of Bremen, Bremen, Germany (schoenhardt@iup.physik.uni-bremen.de),

(2) Royal Belgian Institute for Space Aeronomy (BIRA-IASB), Brussels, Belgium

Halogen species are injected into the atmosphere by volcanic eruptions. Previous studies have reported observations of chlorine and bromine oxides in volcanic plumes. These emissions have a significant impact on the chemistry within the plume as well as on upper troposphere and lower stratosphere composition, e.g. through ozone depletion. Volcanic halogen oxides have been observed from different platforms, from ground, aircraft and from satellite.

The present study reports on satellite observations of iodine monoxide, IO, following the eruption of the Kasatochi volcano, Alaska, in August 2008. Satellite measurements from the SCIAMACHY sensor onboard ENVISAT are used. In addition, the volcanic IO plume is also retrieved from GOME-2 / MetOP-A measurements. Largest IO column amounts reach up to more than 4×10^{13} molec/cm², the results from both instruments being consistent. The IO plume has a very similar shape as the BrO plume and is observed for several days following the eruption.

The present observations are the first evidence that besides chlorine and bromine oxides also iodine oxides can be emitted by volcanic eruptions. This has important implications for atmospheric composition and background iodine levels. Together with the simultaneous observations of BrO and SO₂, iodine monoxide columns can possibly provide insights into the composition of the magma.