



SO₂ and BrO observation in the plume of the Eyjafjallajökull volcano 2010: CARIBIC and GOME-2 retrievals

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The ash cloud of the Eyjafjallajökull volcano on Iceland caused closure of large parts of European airspace in April and May 2010. For the validation and improvement of the European volcanic ash forecast models several research flights were performed. Also the CARIBIC (Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrument Container) flying laboratory, which routinely measures at cruise altitude (11 km) performed three dedicated measurements flights through sections of the ash plume. Although the focus of these flights was on the detection and quantification of the volcanic ash, we report here on sulphur dioxide (SO₂) and bromine monoxide (BrO) measurements with the CARIBIC DOAS (Differential Optical Absorption Spectroscopy) instrument during the second of these special flights on 16 May 2010. As the BrO and the SO₂ observations coincide, we assume the BrO to have been formed inside the volcanic plume. Both SO₂ and BrO observations agree well with simultaneous satellite (GOME-2) observations. SO₂ column densities retrieved from satellite observations are often used as an indicator for volcanic ash. For SO₂ some additional information on the local distribution can be derived from a comparison of forward and back scan GOME-2 data. More details on the local plume size and position are retrieved by combining CARIBIC and GOME-2 data.