



UV and IR measurements of sulphur dioxide emissions during and after the 2014-2015 Bárðarbunga eruption, Iceland

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A basaltic fissure eruption of the Bárðarbunga volcanic system, Iceland, occurred from 31st August 2014 until 28th February 2015. This flood basalt eruption produced 1.6 km³ of lava and emitted sulphur dioxide (SO₂) from the vents at rates of up to 3800 kg/s forming an eruption plume that could easily be detected from space. SO₂ was also released by the cooling lava flows forming a low level haze. SO₂ emissions were monitored using multiple techniques including scanning differential optical absorption spectrometers (DOAS), mobile DOAS traverses, and a NicAIR II infrared camera.

UV DOAS data have been processed to distinguish the SO₂ released by the degassing lava field as it cooled, both during and after the eruption. Initial results show that during February, the final month of the eruption, the lava field released about 3 kg/s of SO₂. The lava field continued to emit detectable levels of SO₂ at lower quantities in March, following the end of the eruption.

Brightness temperature differences using 8.62 and 10.87 μm channels on the IR camera have been processed to calculate the column amounts of SO₂ within the eruption plume. SO₂ path lengths of over 700 ppm-m have been retrieved in November. This has been achieved despite the challenges of high H₂O concentrations in the plume and high gas concentrations above the lava field. Poor meteorological conditions often resulted in a lack of clear sky within the images causing difficulties constraining background SO₂ levels.