

Monitoring the Bardarbunga eruption using GOME-2/Metop-A & -B

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ABSTRACT:

We present here the results of the Bardarbunga eruption monitored by the GOME-2 instrument aboard MetOp-A & -B. After increased seismic activity in August, the Icelandic volcano Bardarbunga (Bárðarbunga) erupted on 31 August 2014. Since 1 September the GOME-2 instruments aboard the MetOp-A and -B satellites detect a continuous emission of sulphur-dioxide (SO₂) emitted from the Holuhraun fissure at the flanks of the Bardarbunga volcano. At the beginning the emitted SO₂ was mainly transported to the north-eastern direction over Scandinavia and Russia. However, on September 22 an SO₂ cloud was even moving over Europe and could be detected at the Hohenpeissenberg and Schneefernerhaus observatories.

So far no volcanic ash was ejected due to the so far effusive nature of the eruption. However, an explosive eruption of the volcano is still possible, which will probably produce large amounts of volcanic ash and could affect the air traffic over Europe.

SO₂ emissions are a good indicator for volcanic activity, since besides weak anthropogenic emissions there are no other known sources for atmospheric SO₂, which can cause respiratory problems in the local population and the aircraft passengers. Furthermore in form of acid rain it increases the oxidation of aircraft components.

It was found that for some volcanic eruptions SO₂ can be a good proxy for the much harder to detect volcanic ash. Volcanic ash can be hazardous not only for the local population but also for aviation since it can cause total engine failure if it melts and then congeals in the engine. Furthermore ash is highly abrasive to engine turbine vanes and propellers.

Under the leadership of IMF, DLR-EOC provides operational trace gas measurements, including total SO₂ columns, in near-real-time (i.e., within 2 hours of recording) in the framework of EUMETSAT's Satellite Application Facility on Ozone and Atmospheric Chemistry Monitoring (O3M-SAF).

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