



Monitoring of volcanic emissions of SO₂ and ash

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Volcanic eruptions can emit large quantities of fine particles (ash) into the atmosphere as well as several trace gases, such as water vapour, carbon dioxide, sulphur species (SO₂, H₂S) and halogens (HCl, HBr, HF). These volcanic ejecta can have a considerable impact on the atmosphere, human health and society.

Volcanic ash in particular is known to be a major threat for aviation, especially after dispersion over long distances (>1000 km) from the erupting volcano. In this respect, the continuous monitoring of volcanic ash from space is playing an essential role for the mitigation of aviation hazards. Compared to ash, SO₂ is less critical for aviation safety, but is much easier to measure. Therefore, SO₂ observations are often used as a marker of volcanic ash in the atmosphere. Moreover, SO₂ yields information on the processes occurring in the magmatic system and is used as a proxy for the eruptive rate.

In this presentation we give an overview of recent developments of the Support to Aviation Control Service (SACS). The focus is on the near-real time detection and monitoring of volcanic plumes of ash and SO₂ using polar-orbiting instruments GOME-2, OMI, IASI and AIRS. The second part of the talk is dedicated to the determination of volcanic SO₂ fluxes from satellite measurements. We review different techniques and investigate the temporal evolution of the total emissions of SO₂ for recent volcanic events.