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Using satellite data to obtain information on the Eyjafjallajökull ash plume

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The Eyjafjallajökull volcano erupted on 14 April 2010 and huge amounts of volcanic ash were ejected into the atmosphere. The ash cloud was transported to NW Europe, resulting in the closure of part of the European air space, which in turn had enormous financial consequences. Models were used to forecast the transport of the ash plume, but initially there were large uncertainties regarding the amount of ash emitted and the height of the ash plume. This information can potentially be provided from the analysis of satellite measurements. The evolution of the plume was visualized with geostationary satellites (MSG/SEVIRI) both day and night using combinations of channels. Different kinds of processing provide qualitative information on the evolution of the plume and the phase (ash, ice or water clouds). Polar orbiting satellites provide qualitative information on the occurrence of ash plumes and the data can be processed to provide quantitative information on the aerosol optical depth (AOD), the dispersion of aerosols (MODIS, MISR, MERIS, AATSR, etc.) and, from multi-angle imaging, maps of plume height and particle sphericity (e.g. MISR). Thermal infrared channels can be used to discriminate between water / ice clouds and volcanic ash or dust. UV/VIS channels (OMI, GOME-2) can determine SO2 concentrations and the Aerosol Absorbing Index (AAI), which, unlike other parameters, can also be retrieved for aerosols above clouds. Infrared spectrometers provide information on trace gases and details of ash composition. In this presentation, examples are given from aerosol retrievals using radiometers with channels in the UV/VIS, NIR and TIR. Examples of plume height retrievals from MISR and CALIPSO will be presented as well.