



Lidar observation of Eyjafjallajökull ash layer evolution above the Swiss Plateau

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The Iceland volcano Eyjafjallajökull started to emit significant amounts of volcanic ash and SO₂ on 15th April 2010, following the initial eruption on 20th March 2010. In the next days, the ash was dispersed over large parts of Europe resulting in the closure of the major part of the European airspace. Information about spatial and temporal evolution of the cloud was needed urgently to define the conditions for opening the airspace. Satellite, airborne and ground observations together with meteorological models were used to evaluate the cloud propagation and evolution. While the horizontal extents of the volcanic cloud were accurately captured by satellite images, it remained difficult to obtain accurate information about the cloud base and top height, density and dynamics. During this event lidars demonstrated that they were the only ground based instruments allowing monitoring of the vertical distribution of the volcanic ash. Here we present observational results showing the evolution of the volcanic layer over the Swiss plateau. The measurements were carried out by one Raman lidar located in Payerne, two elastic lidars located in Neuchâtel and Zurich, and a backscatter sonde launched from Zurich. The observations by the lidars have shown very similar time evolution, coherent with the backscatter sonde profiles and characterized by the appearance of the ash layer on the evening of 16th, followed by descend to 2-3 km during the next day and final mixing with the ABL on 19th. Simultaneous water vapor data from the Payerne lidar show low water content of the ash layer.

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