



## **4D distribution of the 2010 Eyjafjallajökull ash plume over Europe observed by the European Lidar network EARLINET**

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Aerosols originating from volcanic emissions have an impact on the climate, on environmental conditions and could be very dangerous for aircraft in flight, as occurred in the case of the last Eyjafjallajökull volcano eruption event in April-May 2010 when the airspace over Europe was closed for several days.

EARLINET, the European Aerosol Research Lidar NETwork, established in 2000, is the only instrument world-wide, with its multi-wavelength Raman lidar systems, able to provide both intensive and extensive optical data to be used for aerosol typing and for the retrieval of particle microphysical properties as a function of altitude.

EARLINET monitored the volcanic plume from the Eyjafjallajökull volcano in Iceland since it started erupting on 14 April and for the whole event until 23 May 2010.

During this volcanic event, EARLINET collected a large amount of data which represent an unprecedented data set for evaluating satellite data and aerosol dispersion models. Intensive and extensive aerosol optical parameters derived from EARLINET observations have been used to characterize the particles originated from the volcanic eruption. For the first time a volcanic mask and the 4D distribution on continental scale for a volcanic eruption have been obtained from the analysis of these data.

During the first days, volcanic particles were detected over Central Europe over a wide range of altitudes, from 12 km down to the local planetary boundary layer (PBL). After 19 April volcanic particles were detected over South-South Eastern Europe. At the beginning of May (5-15 May), material emitted by the Eyjafjallajökull volcano was detected over Spain and Portugal and then over the Mediterranean and the Balkans. Last observations of the event have been recorded until 20 May in Central Europe and in the Eastern Mediterranean area.

The presented results demonstrate that this volcanic event affected the whole European continent in different phases, with different particle load and properties which caused different impact on aviation.