



## **Observations of Eyjafjallajökull eruption's plume at Potenza EARLINET station**

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Eyjafjallajökull is one of the smallest glacier in Iceland. After seismic activity recorded during December 2009, a first eruption started on 20 March, between 22:30 and 23:30 UT. After a brief stop, a new phase of the Eyjafjallajökull eruption started around midnight on April 14, where melt penetrated its way to the central crater beneath the glacier. An eruption plume was observed in the early morning on 14 April. Ash loaded eruption plume rose to more than 8 km height, deflected to the East by westerly winds. Eruptive activity continued in the following days until 23 April with variable maximum height (between 8 and 2 km a.s.l.). Until 27 April, a plume is always visible in proximity of the volcano.

On 15 April, the eruption plume reaches continental Europe with closure of airspace over large part of Northern Europe. In the following days, airspace was closed also in some regions of Southern Europe. On 15 April, 10:00 UT CNR-IMAA, Potenza distributed an alert to EARLINET stations informing about a large amount of ash is directing towards North-West of Europe. Even if EARLINET is not an operational, but research oriented, network, almost all the EARLINET stations followed the event performing measurements whenever weather conditions allow it.

Because of their proximity to the source, England and Scandinavian countries are of course the most involved in the transported ash arrival. Accordingly to the MetOffice forecasts, the ash plume would have to reach Central Europe on 16 April. The transport toward South was almost blocked by the Alps. A different scenario is forecasted by MetOffice for 20-21 April when the arrival of the volcanic plume is forecasted down to the Southern Italy.

At CNR-IMAA, the atmospheric observatory (CIAO) followed the event by means of all available instruments, including EARLINET multi-wavelength lidars, cloud-radar, microwave profiler and AERONET sun-photometer. Low clouds and rain did not permit measurements over Potenza for the period starting from the distributed alert on 15 April until the evening of 19 April. Since 19 April, measurements were performed almost continuously, with breaks only for light rain and low clouds, until 22 April evening when intense rain started again.

During the whole observation period aerosol content is not negligible in the free troposphere with sparse aerosols distributed between 3 and 8 km a.s.l. In addition thin layers are distinguishable in the reported temporal evolution at different times and altitudes (e.g. descending layer between 10 and 5 km on 21 April, 00:00 UT –14:00 UT).

The most intense aerosol return above the PBL is observed on 20 April around 22:20 UT at about 4 km a.s.l. Ancillary information confirm the volcanic origin of the selected layer.

Accordingly to DREAM forecast, no dust should be present over Italy for this day.

HYSPLIT backtrajectories show that the observed layer comes from Northern Europe, probably from Iceland. In the following hours, the volcanic layer went down in altitude, mixing with the underlying local aerosol layer.

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