



## **Volcanic ash layer depth: Processes and mechanisms**

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The long duration of the 2010 Eyjafjallajokull eruption provided a unique opportunity to measure a widely dispersed volcanic ash cloud. Layers of volcanic ash were observed by the European Aerosol Research Lidar Network (EARLINET) with a mean depth of 1.2 km and standard deviation of 0.9 km. In this presentation we evaluate the ability of the UK Met Office's Numerical Atmospheric-dispersion Modelling Environment (NAME) to simulate the observed ash layers and examine the processes controlling their depth.

NAME simulates distal ash layer depths exceptionally well with a mean depth of 1.2 km and standard deviation of 0.7 km. The dominant process determining the depth of ash layers over Europe is the balance between the vertical wind shear (which acts to reduce the depth of the ash layers) and vertical turbulent mixing (which acts to deepen the layers). Interestingly, differential sedimentation of ash particles and the volcano vertical emission profile play relatively minor roles.