Geophysical Research Abstracts
Vol. 13, EGU2011-4952, 2011
EGU General Assembly 2011

Modelling and forecasting the Eyjafjallajökull volcanic ash cloud using the FALL3D ash dispersion model

Arnau Folch (1), Sara Basart (1), and Antonio Costa (2)

(1) Barcelona Supercomputing Center, Earth Sciences, Barcelona, Spain (arnau.folch@bsc.es), (2) Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Vesuviano, Italy

Airborne volcanic ash and aerosols threat aerial navigation and can affect air quality at medium to large distances downwind from the volcano. The April-May 2010 Eyjafjallajökull eruption has triggered the biggest aviation shutdown of the history causing important socioeconomic losses. Volcanic ash cloud models are used, together with remote and ground-based sensing, by Volcanic Ash Advisory Centers (VAAC) to forecast unsafe flight areas. FALL3D is an Eulerian ash dispersion model based on the solution of the advection-diffusion-sedimentation equation. The model runs at any scale, from regional to global, and is off-line coupled with global and mesoscale meteorological models and with re-analysis datasets. The model outputs ash deposit load, deposit thickness, arrival times at selected points, airborne concentration (concentration at flight levels), cloud mass, and aerosol optical depth (AOD). FALL3D has been used to model the 14-20 April dispersion episode with the only information available during the crisis and then set up in operational mode at the Barcelona Supercomputing Center for a 72h daily forecast of ash dispersion over Europe. Here we report the results of the 14-20 April simulations and the comparison of numerical simulations with satellite imagery and ground-based observations from AERONET and EARLINET networks.