



Aircraft-based observations and high-resolution simulations of a dust storm in Iceland

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The first aircraft-based observations of an Icelandic dust storm are presented. The measurements were carried out over the ocean near Iceland's south coast in February 2007. This dust event occurred in conjunction with an easterly barrier jet of more than 30 m/s. The aircraft measurements show high particle mass mixing ratios in an area of low wind speeds in the wake of Iceland near the coast, decreasing abruptly towards the jet. Simulations from the Weather Research and Forecasting Model coupled with Chemistry (WRF/Chem) indicate that the measured high mass mixing ratios and observed low visibility inside the wake are due to dust transported from Icelandic sand fields towards the ocean. This is confirmed by meteorological station data. Primary dust sources are glacial outwash terrains located near the M'yardalsjökull glacier. Sea salt aerosols produced by the impact of strong winds on the ocean surface started to dominate as the aircraft flew away from Iceland into the jet. The present results support recent studies which suggest that Icelandic deserts should be considered as important dust sources in global and regional climate models.