

Press Release

No. 046 | jh | April 20, 2010

KIT Researchers Study Volcano Ash Cloud

Measurements and Model Calculations by the Institute of Meteorology and Climate Research



Via the inlet system, air is passed on to the CARIBIC research lab. (Photo: Lufthansa)

Today afternoon, the CARIBIC research laboratory started a measurement flight on a modified Lufthansa passenger aircraft (Airbus A340-600). It is planned to measure the Icelandic volcano ash cloud in the air space between Frankfurt and Scandinavia at altitudes from 3 to 8 km. CARIBIC is a consortium of twelve research institutions from six European countries. The KIT Institute of Meteorology and Climate Research (IMK) is operating five of the fifteen measurement instruments installed in this lab. About 100 trace gases and properties of aerosol particles are measured. The scientists hope to obtain more detailed information on the height distribution and particle composition of the Icelandic volcano ash cloud.

Also other KIT measurements and model calculations contribute to the scientific investigation of the volcano ash cloud. These are:

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Measurements at Garmisch-Partenkirchen and the Schneefernerhaus on the Zugspitze

Within the European lidar measurement network, aerosol lidar measurements are performed. In the night from Friday to Saturday, the particle cloud reached the Alps. During a short cloud-free phase on Saturday evening, it was detected by the high-performance lidar (laser radar) of the Institute of Meteorology and Climate Research of Karlsruhe Institute of Technology above Garmisch-Partenkirchen at heights from 5.5 to 12 km. Hence, the station in the northern Alps reveals a much larger vertical extension of the volcano dust than other lidar stations in northern Germany and the Netherlands before. Turbidity is moderate. The range of sight in the volcanic cloud is more than 200 km in comparison to 25 km near the ground. Garmisch-Partenkirchen is supposed to remain the southernmost lidar station in central Europe, at which observations of the ash cloud are possible. Presently, the flow north of the Alps is splitting up into an eastern and western flow. Measurements of this type have been performed at Garmisch-Partenkirchen for 35 years now and represent one of the longest data series worldwide.



A modified Lufthansa passenger aircraft of the type Airbus A340-600 is carrying the CARIBIC research laboratory. (Photo: Lufthansa)

Measurements at Kiruna/North Sweden and Karlsruhe

IMK performs ground-based FTIR measurements. Evaluation is underway. The signals appear to be weak.

Filter Sampling in the Rhine-Main Area

From Wednesday, filter samples will be taken with a measurement aircraft in the Rhine-Main area. Then, the particle composition will be analyzed in detail in the laboratory.

Model Calculations

In cooperation with the German Weather Service in Offenbach, KIT scientists are performing model calculations of the volcano dust propagation in Europe using the COSMO-ART atmosphere model developed by IMK.

MIPAS/Envisat Satellite Measurements

The volcano aerosols and their impacts on atmospheric trace gases like ozone can be observed with the MIPAS satellite instrument on board of the ENVISAT European research satellite. Processing and analysis of these satellite data, however, will require a large expenditure and, therefore, take some time.



The CARIBIC research laboratory can measure about 100 trace gases and properties of aerosol particles. (Photo: MPI für Chemie, Mainz)

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Other Research Activities

The current "large experiment" of a volcano eruption with a disruption of air traffic will give rise to a number of atmospheric measurements and modelings.

Karlsruhe Institute of Technology (KIT) is a public corporation and state institution of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. KIT focuses on a knowledge triangle that links the tasks of research, teaching, and innovation.

This press release is available on the internet at <u>www.kit.edu</u>.