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15. June 2010

## **Credo of Bruno Neininger concerning the future management of ash-clouds**

After the "hype" of April-17 to 19, where MetAir provided the first and only in-situ-measurements over the continent (the British were first around their island), things have changed. Dozens, if not hundreds of people who were absent during the crisis, are now trying to take control. They suggest us that the problem is very complicated, and needs to be solved by big administrations.

**It is not complicated at all!** Eyjafjallajökull is a stationary source which can be observed. Dozens of well-tested operational meteorological models are available. Even the framework for ensemble-predictions has been established in the past (COSMO-LEPS).

All we need is a tool to measure the emission (characteristics) of the ash close to the source (e.g. by a UAV, a balloon-system, remote sensing, or a combination of it, eventually stationed on a ship, or fully airborne). Then the models calculate the dispersion, which has to be checked e.g. along the line where the concentration is predicted to exceed the 1, 2, or 4 mg/m<sup>3</sup>. Possible means are one up to three research aircraft equipped with a suitable Lidar system, and the existing network of ground based observations.

With this feedback, the models can be adjusted, and refined.

Most important is that **the decision whether and where to fly has to be done by the operators** in the aviation system, i.e. by the airports, airlines, and individual crews. It is the same as with any hazards for aviation (icing, turbulence, thunderstorms, snow on runways, desert dust, etc). Then, also the financial dilemma might be solved: The operators would then have an interest in investing in an efficient monitoring. Most important in such a scenario is the training of the decision makers and the crews concerning the physics of the occurrence and the dispersion of the ash. The models work nearly perfect (one of the main results of our flights), but, they are not well-understood by the users outside of the meteorological community. This is a communication problem, and not a scientific one.

We should not need national point measurements anymore. The closing of air spaces mid of April 2010 should remain history. A necessary step in emergency, because nobody knew nothing. And those who shouted loudest should ask themselves: "Would we have been ready to invest in research for decision making before the crisis?"

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