

Interactive comment on “Airborne observations of the Eyjafjalla volcano ash cloud over Europe during air space closure in April and May 2010” by U. Schumann et al.

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We are grateful for the comments concerning the Sky-OPC instrument.

We do agree to most of the specific comments and will use them to improve the paper.

Page 22141, line 6: The Sky-OPC instrument is not a Forward Scattering Spectrometer Probe (. . .): We agree, that this sentence contains a “copy and paste” mistake. The correct sentence is: Optical Particle Counter (OPC) Grimm SKY-OPC model 1.129, Passive Cavity Aerosol Spectrometer Probe (PCASP), and Forward Scattering Spectrometer Probe (FSSP) of type PMS PCASP-100X, and PMS FSSP-300 (Weinzierl et al., 2009), see Table 1.

Size range of the SKY-OPC: We agree that the size range of the SKY-OPC is $0.25 \mu\text{m} < D < 32 \mu\text{m}$. However, as described in detail on page 22142, the instruments inside the cabin of the Falcon were operated behind an isokinetic inlet. For large particles, the sampling efficiency of this inlet falls off rigorously. Depending on the outside pressure and air speed, the cut-off of the Falcon inlet is near $2.5 \mu\text{m}$. This is the reason, why we do not show OPC data for particle sizes beyond about 2 to $3 \mu\text{m}$. The inlet cut-off can be seen in Figure 7 (top left panel, open triangles): while the size distribution measured with the OPC and the PCASP for particles smaller than $1 \mu\text{m}$ are almost identical, the size distribution of the OPC differs from that of the PCASP/FSSP for particles larger than about 2 to $3 \mu\text{m}$ due to the decreasing sampling efficiency of the inlet.

During the volcanic ash measurements, we operated the SKY-OPC with a time resolution of 6 seconds.

Page 22201, Figure 7 caption: The correct figure caption is: Particle number N , surface S , and volume V per unit size interval and unit ambient volume versus particle diameter D averaged over the flight legs 1 and 6 of Table 3, i.e. Leipzig, 19 April (left panels), and North Atlantic, 2 May 2010 (right panels). PCASP-100X data points are given as blue square symbols, SKY-OPC data as green triangles (...).

Page 22191, Table 1: We will change Table 1 such that it is indicated that the upper size limit of the instruments operated inside the Falcon is due to the Falcon inlet cut-off.

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