Atmos. Chem. Phys. Discuss., 10, C6911–C6913, 2010
www.atmos-chem-phys-discuss.net/10/C6911/2010/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "The Eyjafjallajökull eruption in April 2010 – detection of volcanic plume using in-situ measurements, ozone sondes and a new generation ceilometer network" *by* H. Flentje et al.

Anonymous Referee #2

Received and published: 27 August 2010

This paper shows the observation of recent Iceland volcanic plume in Germany by means of in situ, ozone sondes and ceilometers measurements. More details are needed about some aspects (see detailed comments), in particular for what concerns ceilometers. About this point, author's response to the review #1 comment refers to the AMTD paper Flentje et al., 2010 actually in discussion. In that paper, the ceilometers network is presented showing the observations of 3 episodes of different nature: volcanic ash (Eyjafjallajokull again), Saharan dust and forest fires. However also in that paper a quantitative discussion of the uncertainty affecting aerosol backscatter profiles

as derived from the ceilometers is missing and again authors refer to an additional paper that is currently in preparation. So an important piece of information related to the quality of the ceilometers data is currently missing and it is impossible to judge at present time if these data could be relevant for this study or not. Personally, I do not like multiplying of papers dealing with the same topic. It is my opinion that the paper related to the discussion into details of the accuracy and uncertainties of ceilometers backscatter data is essential for judging this paper and therefore I suggest to freeze this paper until the Hesse et al will not be published.

Detailed comments:

Abstract should shortly presented what has been done and results. Page 14948 line 11: " emissions " probably plume is better Page 14948, line 13-14: .."aerosol extinction coefficients and particle mass concentration were finally obtained" This is not shown in this paper. As reported at page 14953 line11-13 this is a result reported and discussed in Flentje et al 2010 AMTD. This cannot be a result also of this paper.

Page 14949 lines12-17: a short description of evolution of the plume is described here as already known before this study. Is it so or is it a result of the ceilometers network observations? If it is the latter case this information should be not provided here, otherwise references should be properly inserted here and the additional information provided by the ceilometer network should be better underlined in the following. Page 14950 line 2: the extinction coefficient detection limit is unclear to me. For backscatter determination authors use LR assumed value, so I suppose extinction limit depends on this quantity too, it means this limit depends on the type of aerosol. In addition, signal to noise ratio at a certain altitude depends also on the quantity of aerosol at lower altitudes, depending on the attenuation of the backscattered signal due to the presence of the aerosol in the low atmosphere. More details should be provided by authors. Page14953: figure 1 is not readable. It is impossible to read vertical and temporal scale. Page 14593, lines 10-12: see my comments reported for the abstract Page 14953-14954: it would be much better for the reader to have a map reported

measurements sites, both ceilometers, in situ and so on, otherwise it is very difficult to understand evolution and possible correlation with the different measurements. Page 14954, line 12: why the SO2 is enhanced by anthropogenic pollution in April 2010? Page 14955, line 2: include references Page 14955, line 9: at larger distances probably also small particles are expected, please report this in the paper Page 14956, line 20: which kind of conclusions authors have about figure8?

Conclusions in the present shape state something not shown in any part of the paper, namely the capability to forecast when the legal flight ban threshold is imminent to be exceeded. This would be of great relevance, but unfortunately there is nothing in the paper showing this result.

Technical comments Page 14953, line25 : plumes

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 14947, 2010.