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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Particle size distribution factor as an indicator for the impact of the Eyjafjallajökull ash plume at ground level in Augsburg, Germany" *by* M. Pitz et al.

Anonymous Referee #1

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General comments This paper addresses relevant scientific questions within the scope of ACP and the special issue. The application of a known concept – source apportionment by PMF with particle size distribution data – for volcanic ash and Saharan dust contribution to the PM10 mass concentration is relevant and new. The conclusion is well done on the basis of independent analyses methods. The applied methods and assumptions are valid and outlined. The number if investigated cases (one from volcano and one from Saharan dust) is relatively small. It should be concluded (Chap. 4) that further investigation of such natural contributions to PM mass concentrations and comparison with independent analyses methods are necessary to show the accuracy of this source apportionment method. The description of measurements and data anal-

yses methods are sufficient and precise. An appendix supports this. The title clearly reflects the content of the paper. The abstract provides a concise and complete summary. The presentation is well written in good quality. The figures are of high quality and informative. The literature is well reviewed.

Specific comments In Chap. 2.3 the availability or source of the PMF method should be added. The application of the PMF method on the basis of particle size distribution should be described in more detail (not only by citation) to present novel concepts, ideas and tools. The original data used for PMF are never demonstrated (in Fig. 2 the mass fractions in dependence from particle size diameter are shown). It would help to do it. What does it mean here: "Hence, for an interpretation of the PMF factors obtained from particle size distribution data additional data are necessary." – later you discuss it. A discussion of the origin for the quantification of the errors of the results of source apportionment by PMF is required. The error discussion and error values should be included in the discussion and conclusions also. In general it should be checked where it makes sense to present values with digits after the dot (e.g. page 16426).

Technical corrections Use in the appendix the unit μg m-3 as in the rest of the manuscript also. Use consequently the term 'particle mass concentration'. Sometimes the term particle density is used.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 16417, 2011.