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Interactive comment on “Towards a first classification of aerosol shrinkage events” by E. Alonso-Blanco et al.

E. Alonso-Blanco et al.

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The authors would like to thank referee#1 for the comments and opinion about the manuscript. The general points raised and the specific comments are answered together because they are related to the same issues.

General comments:

The paper is a useful description of aerosol shrinkage events phenomena. It is based on a long-term time series, and the results could serve as a basis for further studies of the processes. The main shortage of the paper, however, is that the stated classification is actually not a classification, only a description, as it does not give any straightforward instruction for classification. Some instructions, based on exact values

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would be appreciated, and I also believe, would increase the scientific sounding of the paper.

Specific comments:

The description should not be based only on the concentration maps, but on the mode positions as well. The plots and their subjective evaluation not always have to reveal all the phenomena and processes. Further, the diameters of individual modes would be better to be assessed by fitting individual spectra to capture the processes in a deeper detail and time resolution, rather than stating for example Aitken mode having sizes 30 - 100 nm all the time, not dependent on meteorology etc?

Reply - As it is indicated by the referee, the proposed classification of shrinkage processes in this paper is mainly descriptive, based on the subjective assessment of the evolution of the aerosol size distributions through surface plots, but not only. As can be seen in the section 3.2, "Methodology applied for studying shrinkage events", others quantitative parameters, both meteorological and related to the aerosol size and its distribution, have been evaluated, that could serve as a basis for further studies of the processes.

It is obvious that there is still a long way to go in the classification and study of these processes and it is necessary to provide a more quantitative classification methodology, based for example on the duration of the process, the evaporation rate. . . . Although quantitative criteria (aerosol size distribution, evolution of the Dmode, changes in the air mass. . .) have been used to decide on shrinkage events, it has not been possible identifying all the mechanisms involved, and that is the reason why a classification based on processes previous to the shrinkage events is proposed. Authors think it is not possible to develop a quantitative classification methodology based exclusively on the information of the shrinkage processes identified in a single measurement station. So that, and in addition, given the lack of studies on this topic and that the authors of this work think that beyond the three groups of shrinkages identified in this study, no

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other one can exist. They consider that waiting for new works on these processes, the proposed classification is the most appropriate.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 25231, 2015.

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