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***Interactive comment on* “Chemical characterization of springtime submicrometer aerosol in Po Valley, Italy” by S. Saarikoski et al.**

Anonymous Referee #1

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This manuscript presents a comprehensive analysis of aerosol chemical composition in a polluted environment in southern Europe. The analysis is based on three weeks of continuous measurements with an extensive set of instruments. The investigation appears scientifically sound and the results have been presented clearly in the paper. The results themselves, while based on a rather short field campaign, are new and probably useful for the scientific community. I recommend publication of this paper in ACP after the authors have considered the few comments outlined below.

Major issues:

Presentation of the results in section 3 is very long and rather descriptive, making it a bit hard for the reader to pick up the most important findings and related implications. Therefore, I strongly recommend that the authors would add a couple of new

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paragraphs in section 4, in which they i) summarize the most important new scientific findings of this investigation, ii) discuss what implications these findings might have on air pollution and related health issues, and on the interpretation of the results of earlier studies on this subject, iii) give some recommendations for future research, including research priorities.

Related to the comment above, the authors should also sharpen the main goal and more detailed objectives of this paper (Section 1). Stating that "The aim of this study was to investigate the chemistry of submicron particles. . . ." is not quite enough for a scientific paper. The authors can certainly figure out a few items to give the reader a good motivation to have a more detailed look at the contents of the paper.

Minor/technical issues:

Figure 2c: In my eye, the size distributions seem bimodal between 100 and 1000 nm (a clear tail toward smaller particles sizes). Therefore, I do not fully agree with the statement ". . . had one accumulation mode. . ." on page 8285 (line 20). Are the authors suggesting that the tail represents the Aitken mode rather than a smaller accumulation mode? If yes, some more discussion is needed.

Figures in general: Please check out that all the figures have the necessary information that is needed to understand contents of the figure. This means explaining all the symbols and acronyms in the figure, and giving both the quantity and its unit in the figure axis titles. The title of each figure should be easily readable, i.e. large enough font. As a result, long titles such as the one in Figure 9b should be avoided by giving more details in the figure caption.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 8269, 2012.

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