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Interactive comment on “Nitric acid and particulate matter measurements at Athens, Greece, in connection with corrosion studies” by C. Tzanis et al.

Anonymous Referee #2

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The paper is an interesting contribution to the exploration of origin and composition of aerosols in a larger Mediterranean city. The study has been motivated by a project investigating the effects of air pollution on materials, in particular monuments of cultural importance. The results obtained in Athens from passive sampling and presented by the authors are a suggestive example of the complexity of urban aerosol and urban aerosol processes.

An important facet of the study is that about 75 – 80% of the deposited aerosol mass could not be identified by the analytical methods applied. Other measurements usually succeed to identify about 70% or more of the mass (PM₁₀). Soot and organic matter

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have not been investigated, but may considerably contribute to particulate matter in the atmosphere. It would have been interesting to see what the situation in Athens would be in comparison to other locations in Europe. Since deposition measurements of these components do not seem to be available, the authors should at least explain, why they confined their analysis to the ones discussed in their paper. And they should also clearly state at the beginning (in the introduction) which components they are going to focus on and why they are doing so.

As regards the discussion of the identified aerosol components (Na, Ca, K, NH₄, Mg, Cl, SO₄, NO₃) it gives an informative insight into their behaviour under the environmental conditions in Athens. For instance, a rather low contribution of NH₄ to the total mass is reported. This is in contrast to findings for aerosol in Central Europe and is a peculiar feature which would be a good point for discussion. The authors applied linear regression estimates to show the interdependence of various components using bimonthly averages. Given the small number of data points it is certainly difficult to achieve statistical significance. Nevertheless the relations found can be helpful in identifying the origin of different aerosol components. Yet here the discussion remains vague and some speculation about this issue would add more colour to the otherwise rather descriptive paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 14683, 2009.

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