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Interactive comment on “Composition, size distribution, optical properties and radiative effects of re-suspended local mineral dust of Rome area by individual-particle microanalysis and radiative transfer modelling” by A. Pietrodangelo et al.

Anonymous Referee #1

Received and published: 14 July 2015

Revision of the paper by Pitrodangelo et al.

At first I want to apologize for the delay of my review. The paper by Pietrodangelo et al. analyses the composition, size distribution, optical properties and radiative effects of local resuspended dust particles in the area of Rome. The paper is well written and all the laboratory analyses are performed with following a rigorous approach. The results indicate several differences in the chemical composition/size distribution of the

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resuspended dust which is discussed to play a role in modulating the particle optical properties and radiative effects in the area of Rome.

The paper has potentially the interest for publication on ACP, however I have several major concerns, which are listed below:

1. Concerning the introduction/context: I have some problems in identifying the importance of the study in link to the mean aerosol composition/optical depth in the area of Rome. Which is the fraction of PM10 that can be associated to resuspended dust in the area of Rome? Which is the frequency of occurrence of these episodes and their impact on the visible optical depth?
2. Concerning the representativeness of the considered samples: how the size distribution of the analysed samples is representative of airborne particles? And for the mineralogy?
3. What about the obtained mineralogical composition in comparison with that of similar sources? It is possible to have a comparison with other studies?
4. Concerning the calculation of the optical properties, I do not agree with the fact that calcite is not absorbing; conversely, in the shortwave, calcite is one of the most absorbing minerals. I think you have to reconsider the choices of the refractive indices for your minerals/samples. Moreover, considering that you have measured the mineralogy, why not calculating the complex refractive index based on the mineralogical composition using either an internal mixing or external mixing rule?
5. Concerning the presentation of the study, I find that the text is too long and that there are too many experimental details both in the measurements section and in the results section. I would suggest to reorganize the paper considering moving some technical parts to Appendix.

Specific comments

Abstract: define BOA here. Add also some “numbers” in the Abstract, i.e. concerning

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the radiative effect or the optical properties.

Page 13349, lines 25-26: the indirect effect is not linked to the “warming or cooling of the atmosphere”, please correct.

You missed the reference by Rodriguez et al. (2012) in the reference list.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 13347, 2015.

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