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Interactive comment on “Aerosol direct radiative forcing during Sahara dust intrusions in the Central Mediterranean” by M. R. Perrone et al.

Anonymous Referee #2

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This paper has attempted to produce radiative forcings of Sahara dust events. The methodology is weak as it uses input radiative properties of aerosols and atmospheric data that are not specific to the monitoring site or the highly variable aerosol distributions. The end result is unreliable estimates of the radiative forcing.

Major Comments

1. The radiative properties of aerosols are strongly dependent on wavelength, chemical composition, and on particle size. The authors have divided the aerosols into fine and coarse modes then used n and k values independent of particle size to derive the aerosol radiative properties for fine and coarse modes.
2. The use of fixed aerosol absorption properties (Table 1) in the infrared taken from the

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literature has probably little relevance to the radiative properties of the fine and coarse modes of the actual site, as do atmospheric properties similarly taken from literature, other places or different times.

3. The validation of the downwelling infrared radiation itself is not possible in this study as there are no measurements. Thus, it is difficult to assess the reliability of the forcings.

4. The surface albedo in the visible is around 10%, which corresponds to vegetation cover as an average. How reliable is this for the whole wider site?

5. In summary, this paper claims a lot more than actually reliably demonstrated.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 20673, 2010.

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