

## ***Interactive comment on “A unified approach to aerosol remote sensing and type specification in the infrared” by L. Clarisse et al.***

### **Anonymous Referee #1**

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The paper by Clarisse et al. deals with the detection of various aerosol types or ice clouds from spaceborne high spectral infrared measurements made by IASI. A substantial part of this paper consists of a review of existing detection methods (feature detection, spectral fitting, distance approaches, singular value decomposition, principal component analysis) and discusses their advantages and drawbacks. With the aim of generalizing and better understanding the above methods, a “general approach” is then proposed and described : the discriminant analysis method. This method is then used to briefly present six applications: ice crystals, sulfuric acid droplets, windblown sand, volcanic ash, ammonium sulfate, and smoke. Here or there, comments are made to answer difficulties met as, for example, in case of windblown sand for which the construction of covariance matrices is not trivial. Concerning the applications, each of them, important in itself, is presented in a much too concise manner. There is also

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some lack of clarity regarding the way the “general approach” as it is described in the first part is finally applied to each case. A selection of fewer examples, given with more extensive explanations, would be more convincing. As it is, the paper is largely methodological. This paper is constructive but rather technical and appears better suited to AMTD. I thus recommend the paper be resubmitted to AMTD.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 26871, 2012.

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