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Atmospheric Measurement Techniques Discussions
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Interactive comment on "Profiling aerosol optical, microphysical and hygroscopic properties in ambient conditions by combining in-situ and remote sensing" *by* Alexandra Tsekeri et al.

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Review of Referee #2:

Review of paper: Profiling aerosol optical, microphysical and hygroscopic properties in ambient conditions by combining in-situ and remote sensing, by A. Tsekeri, V. Amiridis, F. Marenco, A. Nenes, E. Marinou, S. Solomos,P. Rosenberg, J. Trembath, G. J. Nott, J. Allan, M. Le Breton, A. Bacak, H. Coe, C. Percival, and N. Mihalopoulos The authors present in details a complex procedure as IRRA-In-situ/Remote sensing aerosol Retrieval Algorithm. This combines airborne in-situ and lidar remote sensing data to retrieve vertical profiles of ambient aerosol optical, microphysical and hygroscopic properties, employing the ISORROPIA II model for acquiring the hygroscopic growth.

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Discussion paper

The proposed methodology is improving our current understanding regarding humid conditions for aerosol characterization and is going to be valuable for applications in aerosol-cloud interaction schemes. Also it could become a validation-tool for active space-borne sensors, as proven in here for the case of CALIPSO. The text is very clear and even though is a long paper it reads well. I believe the manuscript is worth publication. Overall the paper provides useful information. The subject and the results of the paper will be of interest to lidar and atmospheric science researchers even though the presented techniques are not new.

Answer to Referee #2:

We thank the reviewer for his/her comments.

The reviewer says that the presented techniques are not new, but we need to clarify here that the IRRA innovation does not lay on the individual techniques per se, but on their synergy in the retrieval. It is due to this synergy that IRRA manages to combine remote sensing with in-situ measurements in the retrieval, even for high relative humidity cases. To our knowledge, this has never been done before.

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Discussion paper