

Interactive comment on “Mid-latitude cirrus classification at Rome Tor Vergata through a multi-channel Raman–Mie–Rayleigh lidar” by D. Dionisi et al.

D. Dionisi et al.

dionisi@latmos.ipsl.fr

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We thank the anonymous referees for the constructive comments that have been useful to improve the paper. We would like to specify that, as pointed in the abstract, the principal purpose of this study has been to use for the first time the dataset of RTV lidar to characterize cirrus clouds over the Italian site and to attest the robustness of cirrus classification through multivariate approach, which, before this work, was only used over the OHP French site. The comparison of the RTV results to the ones obtained by OHP analysis attests the validity both of the employment of RTV lidar on cirrus investigation and of the clustering method used. To characterize the different classes,

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a first analysis of the cirrus optical properties, derived by lidar, was conducted. The retrieved results are characterized by several uncertainties but give some indications about the cirrus generation methods and confirm that dedicated studies are needed to further investigate the attribution and origin of cirrus classes. The next planned step will be to relate each class to one or more processes controlling cirrus formation and evolution, using additional parameters to characterize cirrus interaction with the surrounding thermodynamical environment. Following the comments of the referees, several corrections have been made on the paper. In particular section 2.3 has been expanded to add more details about the used classification methodology. To properly address the revised interpretation of the cirrus optical properties derived by lidar and the preliminary analysis of meteorological parameters related to cirrus classes, which has been added in the paper, section 3.2 has been divided in three subsections and conclusions were modified. We include as additional information the .pdf file of the final discussion paper with all the corrections highlighted in yellow.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/13/C5854/2013/acpd-13-C5854-2013-supplement.pdf>

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