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Discussions

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Interactive comment on "EARLINET evaluation of the CATS L2 aerosol backscatter coefficient product" *by* Emmanouil Proestakis et al.

Anonymous Referee #2

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General comments:

This manuscript compares EARLINET (ground-based) and CATS (onboard the international spatial station) retrievals of the aerosol backscatter coefficient over 12 European sites and 1 Asian site. The paper is well written, however, I did miss some explanation in the introduction about the importance of CATS product. I believe this could be easily achieved by modifying the order of some paragraphs and including extra information. In particular, I suggest moving the second paragraph of Section 2.2 (page 4, line 30 to page 5, line 12) to the introduction, with the due adjustments. I also suggest comparing some scenes of coincident vertical profiles of CATS and CALIOP. Would that be possible? I believe this would dramatically improve the visibility of the paper. Also, it wasn't clear to me whether CATS should only be used to fill a gap in space-based lidar

observations or if it is as reliable as CALIOP. I believe this should be further clarified in the text. I also believe a final paragraph stating the main conclusion is needed (that is, what are your suggestions for future studies: should we use CATS or not, under which conditions these retrievals are reliable, what are their advantages and disadvantages and how could future studies benefit - or not - from CATS).

Specific comments:

page 2, line 3 - Please modify "Physic" to "Physics". page 2, line 20 - Please reformulate the sentence (suggestion: "Quality assessment of CATS..."). page 2, line 24 - Please modify "consists" to "consists of". page 3, line 15 - What is the difference between capacity and capability? page 3, line 16 - Please reformulate or remove the sentence "EARLINET stations are classified as active on condition of...". page 4, line 32 - Please modify "space-borne" to "spaceborne". page 6, line 16 - It's not clear to me if observations more than 90 minutes apart were compared or not. Could you clarify this? page 6, line 24 - What does "including cirrus clouds" mean? Cirrus clouds scenes were used or not? page 7, line 19 - Please modify "participated" to "participating". page 7, line 20 - "exited". Did you mean "excited"? page 9, line 14 - Please modify "in details" to "in detail". page 9, line 24 - Please modify "below" to "of". page 9, line 37 - Please modify "over-lying" to "overlaying". page 11, line 22 - Has the new product already been released? How does the new algorithm differ from the previous one? What kind of improvements does it present? pages 11 and 12, Section 3.2 and Table 2: It would be interesting to show the mean relative bias (that is bias over mean value). page 14, line 10, Please modify "discrepancies" to "discrepancy". page 15, line 1, Please modify "based to" to "based on". Figs. 3 to 5: Please use "b) CATS backscatter coefficient at 1064 nm", or "(1064 nm)". Fig. 5: I would guess topography influence CATS coefficient quite significantly. Could it be causing the spykes shown in this figure? Could you provide a quantitative estimate of the contributing effect of topography on the discrepancy observed in this figure? What about an estimate of the other contributing effects?

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