

Response to interactive comment by A. Kumar

Thank you for your interest in this work. Here is our response to your comments:

1) At page 3, line#3 and 4, V4 is defined as version 4.00 and 4.10. In the similar manner V3 should also be defined at its first usage (line#9, page 3 or at line#33 at page 1).

The sentence in lines 3-4 in page 3 has been modified as:

“Henceforth, we will refer to both version 4.00 and version 4.10 as V4, as they use exactly the same calibration algorithm and all version 3 data as V3.”

2) There is no symmetry in using the defined acronym "MERRA-2", as it is also used as MERRA 2 and MERRA2 in the manuscript.

MERRA-2 has now been used uniformly throughout the text.

3) At some places, authors have used version 4.1 and later as version 4.10, and more-over they defined version 4.00 and version 4.10 as V4. All these may leads to confusion in the mind of readers. So better use a single nomenclature.

Version 4.1 has been replaced by version 4 in the abstract. To avoid confusion, all version 4 data have been defined as V4 and all version 3 data have been defined as V3 in page 2.

4) Acronym for signal-to-noise ratio is to be defined at its first usage (at page 1 line 28 rather than at page 3, line#7)

Done.

5)At page 3, line # 11-13 i.e. last sentence of the paragraph needs some revision because it is not too clear that whether the bias reduction is shown in the earlier study i.e. Rogers et al., 2011 or in the present study

We believe the text here clearly describes that the bias reduction is being shown in the current study.

6) At page 4 line#17, the statement " The most extensive and accurate measurements" should be supported with some references

The relevant references are listed in the same page after the next sentence.

7) Authors should also cite the following papers in the Introduction section:

- (a) *Vaughan et al., 2016. Cloud – Aerosol LIDAR Infrared Pathfinder Satellite Observations (CALIPSO), Data Management System, Data Products Catalog, Document No: PC-SCI-503, Release 4.10 (June 6, 2017 and December 14, 2016).*
- (b) *Kumar, A., Singh, N., Anshumali, and Solanki, R.: Evaluation and utilization of MODIS and CALIPSO aerosol retrievals over a complex terrain in Himalaya, Remote Sensing of Environment, Volume 206, 1 March 2018, Pages 139-155, ISSN 0034-4257, <https://doi.org/10.1016/j.rse.2017.12.019>.*
- (c) *Thomason, L. W., Pitts, M. C., and Winker, D. M.: CALIPSO observations of stratospheric aerosols: a preliminary assessment, Atmos. Chem. Phys., 7, 5283-5290, <https://doi.org/10.5194/acp-7-5283-2007>, 2007.*

We have added the citation to the Vaughan et al. document, but did not find the other two papers to be of direct relevance and hence avoided referencing them.