

Atmos. Chem. Phys. Discuss., referee comment RC1 https://doi.org/10.5194/acp-2022-374-RC1, 2022 © Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.

## Comment on acp-2022-374

Anonymous Referee #1

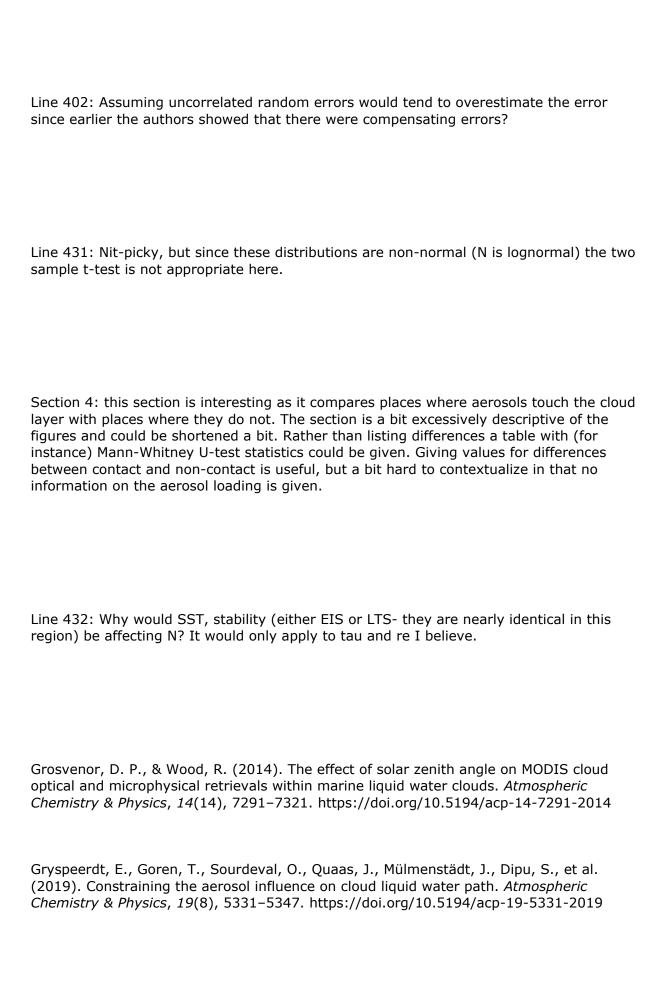
Referee comment on "In situ and satellite-based estimates of cloud properties and aerosol-cloud interactions over the southeast Atlantic Ocean" by Siddhant Gupta et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-374-RC1, 2022

The paper is well written and I only have a few minor comments. The paper is thorough, which is appreciated as it documents the steps of the retrieval and the satellite comparison in a way that will be helpful to others.

Line 55: It seems like the authors are only discussing the first indirect effect and not adjustments. They could also cite work by others discussing aerosol cloud adjustments in the context of meteorological confounding variables and causal ambiguity (Gryspeerdt et al., 2019; McCoy et al., 2020). They may also wish to cite (Wood et al., 2012).

Line 146: What is the scale of the profile? Does this mean that on a research flight the max height at which cloud occurred and the min height were used? If the profile is too extensive it is not clear if this is a particularly good assumption and it is unclear why the median was not used. I may have understood what is being referred to and a small amount of additional information here might be helpful to readers.

Line 343: this compensating uncertainty is consistent with earlier studies such as (Painemal & Zuidema, 2011) and (Grosvenor & Wood, 2014).



McCoy, D. T., Field, P., Gordon, H., Elsaesser, G. S., & Grosvenor, D. P. (2020). Untangling causality in midlatitude aerosol–cloud adjustments. *Atmos. Chem. Phys.*, 20(7), 4085–4103. https://doi.org/10.5194/acp-20-4085-2020

Painemal, D., & Zuidema, P. (2011). Assessment of MODIS cloud effective radius and optical thickness retrievals over the Southeast Pacific with VOCALS-REx in situ measurements. *Journal of Geophysical Research-Atmospheres*, *116*. https://doi.org/D24206 10.1029/2011jd016155

Wood, R., Leon, D., Lebsock, M., Snider, J., & Clarke, A. D. (2012). Precipitation driving of droplet concentration variability in marine low clouds. *Journal of Geophysical Research: Atmospheres*, *117*(D19), n/a-n/a. https://doi.org/10.1029/2012jd018305