

Review of “Radiative-dynamical interaction of tropical upper tropospheric clouds: sensitivity to ice cloud parameterizations”, by Stubenrauch and coauthors, egusphere-2026-5049.

This is a very in-depth modeling analysis of how the ITCZ and Hadley circulation are affected by semi-transparent and opaque high clouds for the months of January and July, using the LMDZ model. It’s a rigorous treatment, using two different ice particle habit representations (hexagonal ice crystals, different assumed terminal velocity representations and total water content in a grid cell. Overall, the article provides interesting and important results.

Major Comments

Line 84 hexagonal ice crystals versus the Baran habit distribution. It is really interesting to have done the comparison (Table 1).

There are other parameterizations for the ice particle size distribution and terminal velocity-size relationship as a function of temperature that extend to very low temperatures. I’m not sure that these are needed for your study but I did want to point that out.

Lines 176-177. This explains the difference in high cloud cover at mid- and high latitudes during winter between CALIPSO-ST and CALIPSO-GOCCP. CALIPSO lidar is fully occulted at an optical depth of about 0.5. So, CALIPSO is not ideal for many thunderstorm anvils.

Figure 4. It would be helpful to show a probability distribution function and a cumulative distribution function.

A table of acronyms would be helpful to the readers as there are so many used.

Two things I wondered about. How is the surface precipitation affected? Second, it would be interesting to see if there are associated dynamical affects that differ between semi-transparent and opaque clouds.

Do you think a summary figure in the Conclusions section clearly summarize the results?

Minor Comments

Line 25. “freezing” to “in situ production”

29 “reply to” to “address”

31 “climate” to “global”

50 LMDZ Define acronym

54 “named as” to “termed”

61 “once” to “one”

V_m , PSD parameterization. Could you specifically show the link for the supplemental information because the link is not in the Stubenrauch et al. (2019) publication.

239 also show

286 remove "Already"

453 “provoke” to “produce”