

Atmos. Meas. Tech. Discuss., referee comment RC3  
<https://doi.org/10.5194/amt-2021-219-RC3>, 2021  
© Author(s) 2021. This work is distributed under  
the Creative Commons Attribution 4.0 License.



## Comment on amt-2021-219

Anonymous Referee #3

---

Referee comment on "Impact of second-trip echoes for space-borne high-pulse-repetition-frequency nadir-looking W-band cloud radars" by Alessandro Battaglia, Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-219-RC3>, 2021

---

This is a well written manuscript describing observation, simulation, and prediction of second trip echoes in W-band satellite radar data. It was very useful and insightful to use of CloudSat data showing how second trip echoes appear in non-physical heights in CloudSat observations, yet, these second trip echoes would appear at realistic height ranges when using EarthCare radar operating parameters. The cloud community needs to understand the impact of second trip echoes and this manuscript will help with that education. Also, I am appreciative of the references pointing to prior work.

Two minor comments to help my understanding:

As someone who would like to repeat these simulations so that I understand the math better, can the constants used to generate Figs. 1 and 2b be added to the figure caption or in the text? If I can repeat Fig. 2b, then I could repeat the EarthCare simulations.

Also, I may not understand how profiles with MS scattering are being counted (page 10 line 12). Should a frequency of  $10^{-3.7}$  be one on 5000 profiles (not one in 50 profiles)? Maybe  $10^{-3.7}$  is relative to all profiles in 2008.

I look forward to seeing this manuscript published.