

## ***Interactive comment on “Microphysical Properties of Three Types of Snow Clouds: Implication to Satellite Snowfall Retrievals” by Hwayoung Jeoung et al.***

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Stefan,

Your comments raised very good points and are very informative. We will do careful revisions addressing your concerns. Thanks.

1) Impact of snow scattering on the passive 89 GHz channel.

Your points are well taken. We will add discussion in the revised manuscript and mention the potential error to LWP retrievals, including discussion of your earlier findings. The main reason that we used the current LWP retrieval algorithm is that it uses the

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difference between cloudy and clear-sky observed TBs instead of using the value of TB itself. This configuration removes potential calibration bias and error caused by uncertainties in water vapor contribution. This is particularly helpful when we have only one channel, although it makes it hard to include scattering/reflection effect as you pointed.

2) Correction for radar attenuation.

We didn't do reflectivity corrections before performing SWC retrievals, except that the attenuation by scattering is compensated in the original processing software, so attenuation by gases and liquid water is something we will do in the revision. Thanks. Obviously, the correction will not affect the surface snowfall estimate; it will affect the most to the radar reflectivity at the upper levels.

3) Radar calibration.

We didn't perform calibration ourselves. All calibrations done by the manufacture are assumed to be accurate. Good to know the Kuchler et al. paper. We will add more info from it. 4) Liquid water retrieval. We used Liebe et al. 1993 for refractive index. We will point out uncertainties due to possible errors in refractive index as you stated in your JAMC paper.

5) Cloud top estimate

The spectrum width criterion is just based on our experience by viewing many cases like the one shown in Fig.2. We tried using both the spectrum width and reflectivity, the results are almost identical to those when using spectrum width alone. We don't know the exact reason behind it. This is something worth discussing with manufacture in the future.

Thank you again for the valuable comments, which help us improve the manuscript.

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