Atmospheric Measurement Techniques Discussions

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Comment on amt-2020-518

Anonymous Referee #3

Referee comment on "A simulation-experiment-based assessment of retrievals of above-cloud temperature and water vapor using a hyperspectral infrared sounder" by Jing Feng et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2020-518-RC2, 2021

This paper describes a method of improving the retrieval of temperatures and ice specific humidy using hyperspectral infrared measurements with added synergetic measurements of cloud effective radius and ice water content (IWC). A cloud resolving NWP model is used to generate a scene which acts as the "truth", which is input to MODTRAN for simulating the infrared radiances. The retrieval algorithm used two assumptions. One is the slab assumption which use the simulated radiances as inputs and the other uses synegetic dataset including IWC and cloud effective radius as synthetic measurements. Improvements have been found by adding these synergetic inputs.

The paper is well written except that there are minor typos here and there. For example, Fig. 6 refers "row" as column. Line 216 use um instead of μm for micron. I suggest that the authors do a thorough proof-reading and eliminate these typos.

The abstract is not as informative as I would see from a high quality paper. It merely mentioned that the algorithm is able to detect the spatial distribution of temperature and humidity anomalies above convective storms. Some more quatative results should be summarized here.

Overall, I recommend the publication of this paper with the minor revision incoporated.