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## ***Interactive comment on “Validation of cloud property retrievals with simulated satellite radiances: a case study for SEVIRI” by L. Bugliaro et al.***

### **Anonymous Referee #2**

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#### Overall Assessment

This is an impressive work. This is more rigorous use of simulations that I have seen applied to satellite cloud remote sensing. The language and figures are clear and high quality. I recommend publication. This paper will serve as reference for users of the APICS and CM-SAF algorithm. However, there are some questions that remain with this work. If any progress can be made on the text by addressing these question, great. If not, this paper is still worthy of publication.

- How are these results any more illuminating than what we see in traditional validation studies where multiple products are inter-compared? For example, I am familiar with

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the CM-SAF algorithm. Every issue raised here was also raised during a EUMETSAT funded round-robin comparison where the CM-SAF results were compared to other SEVIRI products. Are there additional analyses to be done to better exploit these simulations? It would be nice to mention this.

- This simulated data should be made available to the public. Otherwise, its description is not very relevant to the community. This could be a good resource.
- Simulations provide full knowledge of the synoptic situation. It would be interesting to fold that into the analysis.

## Specific Comments

- How is vertical integration (over the 35 COSMO layers) of particle size accomplished to obtain the truth-value?
- Since APICS is a DLR algorithm please state if there are any shared RT assumptions with APICS and the model used to generate the simulated radiances. The CM-SAF looks worse than APICS but this could be artificial. You do state this that there are shared assumptions for ice clouds between the simulations and APICS, but what about for water and mixed phase.
- For water clouds, the difference in particle size with APICS and CM-SAF is alarming and greater than what is typically observed between two mature data sets.
- Why so little analysis of the cloud-top height results? It's hard to draw conclusions from Figure 7.
- The downscaling method seems very innovative.

## Technical Comments

- In the abstract, you state the mean difference in cloud temperature is 16.4K. That is really big – is that true?

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