

## ***Interactive comment on “Simulating the effects of mid- to upper-tropospheric clouds on microwave emissions in EC-Earth using COSP” by M. S. Johnston et al.***

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Reviewer's response to AC C5011 [Posted by the associate editor]

### 1. Summary

It's a little bit patronizing to read that we misunderstood the objectives of the paper and that the lack of funding is a reason to submit an incomplete piece of scientific work. Their replies come off as defensive. All of the reviewer comments have very common themes with each other and that is promising since we all agree it could be a much better paper if some more work went into a few particular issues that need attention.

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### 3. Reviewer 2

#### 3.2 Comment 2

The authors reply with a red herring and go on to suggest this comment was about 3d effects and a whole suite of others is not a direct reply to my original comment. I get the impression this reply to my comment is a manufactured excuse to ignore them.

#### 3.3 Comment 3

As a follow on to the previous comment, the first paragraph of the reply is not a response to the comment. In the second paragraph they do say that they will examine and change the microphysics in RTTOV and I will hold them to that (whereas in the reply to Comment 2 it seems like they were dismissing it). With regard to the fall speed, this needs to be fully justified. Also, I don't understand what is so hard about assuming the fall speed is, say, 5m/s, repeat the calculation, look at the resulting differences in the MW Tbs, then determine to first order how sensitive they are to fall speed? There is no need to couple their work with another type of model as they state it in the reply.

#### 3.5 Comment 5

Yes, it is true these are complex issues, but the point is that the authors could briefly discuss how complicated vertical motion in the atmosphere is, and how relevant (or not) this is to the MW Tbs. All they have to do is try a few different velocities and come up with a back of the envelope calculation. It could be that this is a non-issue but we don't know until the work is done.

#### 3.7 Comment 7

Again, a dismissive response. I get the sense that they were trying to publish this paper more as an advertisement for a very narrow capability in COSP rather than as a stand-alone piece of scientific work.

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