

***Interactive comment on* “Can turbulence within the field of view cause significant biases in radiative transfer modelling at the 183 GHz band?” by Xavier Calbet et al.**

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Many thanks for your positive comments about the paper. I hope the paper can make some contribution to clarify the discrepancies in biases at 183 GHz.

I agree with all the comments about the paper.

Issues addressed by Stefan Buehler has been answered in his thread. And they also will be addressed in the next version of the paper.

You are right that the effect of clouds are not addressed in the paper. As you mention, it is not the purpose of the paper. I will try to make this clearer in the introduction of the

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paper.

The paper is meant to test whether the turbulence hypothesis can be used or has to be discarded because its effects are very small. It is obviously not meant as a final proof that turbulence is a major player in the observed biases. For this, a more extensive study would be needed. In a way, this has been done already by Bobryshev et al, where they show that if you select FOVs with little variability, the biases are greatly reduced or disappear completely. Brobryshev et al.'s paper would then be compatible with the turbulence hypothesis.

As you mention, turbulence will vary greatly from one location to another, so this effect would be very scene dependent. If clouds are within the scene, as you mention, this would complicate things further and the RTM would need to take this into account.

The effect of non-linear effects should already be taken care of by the RTM, so I do not think this would have a major effect on the results. The reason a Taylor expansion is used is to establish the mathematical background to calculate this effect, but the "baseline" RTM is still non-linear. Logically, further complications would arise from physical causes that are not well modeled in the RTM (clouds, etc.).

I will upload a new version that should make things clearer.

Many thanks for your comments.

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