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Atmospheric Measurement Techniques Discussions

Interactive comment on "Correlated observation error models for assimilating all-sky infrared radiances" *by* Alan J. Geer

Anonymous Referee #2

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A very well-written manuscript with no obvious flaws which presents a clear picture of some experiments towards infrared all-sky radiance assimilation. The need to inflate the trailing eigenvalues and the justification for doing so is a significant finding and results in a consistency with much of the other work being done and what has been diagnosed from them for similar activities. I find the manuscript is ready for publication after corrections of any wording or clarity flaws which may be uncovered, but none were found by this reviewer.

I was very interested in one particular aspect of the paper. On page 30, beginning about line 20 when the trailing eigenvalues are adjusted so they are no smaller than 1 or 0.37. What is the resulting observation error in brightness temperature space for the clear-sky conditions as compared to the current "clear-sky" technique? Does

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this result in high errors for these same clear-sky scenes when the all-sky technique is applied? It could be a very appropriate thing to do, and could even be indicating additional uncertainty should be added due to non-detection of partially cloud filled pixels.

Lastly, a small note the figures which use 2D line plots use very fine lines. This makes it particularly difficult to often discern between colors particularly the blue and black. Thicker lines though causing some overlap would make these much easier to discriminate.

Very last, very pithy comment. The label “all-sky diag” in figure 16 and 17 one could go ahead and spell out “diagonal” fully as there seems to be plenty of space for this in the figure label.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-379, 2018.

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