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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Technical note: analytical estimation of the optimal parameters for the EOF retrievals of the IASI Level 2 Product Processing Facility and its application using AIRS and ECMWF data" *by* X. Calbet and P. Schlüssel

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Review of a Technical note: analytical estimation of the optimal parameters for the EOF retrievals of the IASI Level 2 Product Processing Facility and its application using AIRS and ECMWF data, by Calbet and Schlussel

The authors discuss some interesting work and provide a valuable contribution for making better use of hyperspectral data that will soon be available from satellite platforms.

There is some relevant information in this article, but there are a few comments below that should be addressed before publication.

Minor comments:

Page 2 (9691): line 23. The authors state that "The EOF retrieval method has been studied before..." but neglect an important reference by Zhou et al. (Thermodynamic product retrieval methodology and validation for NAST-I, Applied Optics Vol.41 No. 33, pg 6957-6966). This article is pertinent and should be referenced.

Page 3 (9693): line 9. The authors decided to make use of Brightness Temperatures (BT) rather than Radiances. If differences are expected from using one or the other, discussion would be extremely valuable.

Page 4 (9695): line 7. Explain the procedure used to discriminate between clear and cloudy spectra.

Figure 1: Please explain if and why the vertical coordinates go only up to 100 hPa.

Figure 14 and 16: the x-axis scale is too small, part of the profiles are left out

Major comment:

The authors work with a full day of ECMWF data, and in so doing, remove a bias from the AIRS observations. While this results in closer agreement between AIRS and ECMWF, there needs to be some scientific discussion about what is the logic used to justify this step of removing the bias. Can the authors account for why the bias is present? Can a bias, if not explainable, be removed from a data set so simply? Where in general bias correction is proved by the authors to be very effective in improving overall retrieval accuracy, does the bias correction of real observed radiances with model derived radiances, and validation of retrievals against model data only, rapresent an optimal approach to high spectral resolution data inversion? It is recommended strongly that the authors make an effort to address and/or discuss these issues in a comprehensive manner.

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