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Atmospheric Measurement Techniques Discussions

Interactive comment on "Matching radiative transfer models and radiosonde data from the EPS/MetOp Sodankylä campaign to IASI measurements" *by* X. Calbet et al.

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General Comments: This is a very interesting and potentially important validation study however an inadequate description of how the calculations were performed leads to inconclusive results. This work is very important because it has direct impact on whether bias corrections ("tuning") can or should be performed in remote sensing retrieval of tropospheric water vapor.

Statement from paper: "LBLRTM has a long development history and for the current study version 11.6 was adopted together with spectroscopical parameters from the

HITRAN 2004 database including updates."

Comment: What database updates exactly? The authors are leaving out critical information that is required to draw conclusions from this study. The details of the LBLRTM version differences 11.6 and 11.3 and OSS needs to be described. More importantly the exact spectroscopic database and "updates" must be included along with an explicit reference to where the relevant water vapor spectroscopic information comes from and whether that spectroscopic data has peer reviewed publications that describe how it was obtained. Recent presentations have shown significant differences in obs-calc depending on what spectroscopic updates are included. In particular, the work of Coudert needs to be discussed and whether the LBLRTM and OSS calculations used this information or not. Coudert et al., 2008, Vol. 251, pp. 339-351 (J. Molecular Spectroscopy)

My suggestion is to greatly expand the discussion of the RTM versions and in particular how the individual calculations were performed. At a minimum, the AER line database version needs to be identified that was used for each calculation along with a reference that describes the differences of the AER database versions and where future readers can obtain those particular database versions.

Statement from Paper: "... three different RTMs OSS, LBLRTM 11.3 and LBLRTM 11.6 ..."

Comment: These are clearly NOT three different RTMs since OSS is derived from LBLRTM v11.3 and LBLRTM v11.6 is an incremental change from v11.3. The authors do not state what AER database was used in the LBLRTM calculations so it is not possible to interpret the results in a meaningful way. In particular the assertion that the obs-calcs agree within the instrument noise is far too strong a statement given the lack of explicit information on the "calcs".

My recommendation is to remove the OSS from the OBS-CALC comparison. The implication that OSS is somehow "better" than the LBLRTM version it is derived from seems absurd. If there are other reasons for showing the OSS results, i.e. because it

is being used operationally at EUMETSAT for example, then that should be treated as a separate discussion where the error between OSS and LBLRTM v11.3 (calc-calc) is explicitly shown for the cases studied and those differences explained.

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 4497, 2010.