Response to the 2nd Review of "Evaluation of the ECHAM family radiation codes performance in the representation of the solar signal" by T. Sukhodolov et al.

About the citation of Nissen et al. (2007):

We have slightly reformulated the reference in this way: :"Nissen et al. (2007) replaced the 4-band scheme of Fouquart and Bonnel (1980) above 70 hPa by a 49-band parameterization FUBrad allowing a good agreement with a reference model." From this it should be clear for readers that two different parameterizations are discussed, and further details they can find in Nissen et al. (2007).

About the absolute values of E4 and E5c:

We have checked all our calculations and have found a mistake in E4 results, thanks to reviewer for attentiveness. Now we have added a new paragraph and figure to section 3 discussing this question, since it touches 3 other papers with similar comparison (Nissen et al. (2007), Cagnazzo et al. (2007) and Forster et al (2011)).

"replace ... underestimate ... with ... overestimate ..."

"replace ... underestimation ... with ... overestimation ..."

"replace ... (E5) ... with ... (E5c) ..." All replaced

About the scaling procedure:

We didn't apply any complicated mathematical methods to find the best fitting to the reference model, which however theoretically can be done by those who else will use this method. Then one will have to consider 4 results of extra-heating parameterizations and the result of his original parameterization. We have estimated appropriate coefficients "by eye". For those parameterizations which use the delta flux (SSI difference between grand minimum and current timestep) it is not crucial which coefficients to take, since the addition to the absolute values is miserable and just fixes them with respect to LibRadtran. However, for those parameterization which use the full flux it is important. We have missed this point when we estimated the coefficients for E5c (thanks again to reviewer for paying our attention to it), because we were only concentrated in this paper on the solar signal. Trying to find a perfect correction around 65 km, we choose the 3.5 and 0.5 coefficients values for SRB and LYA, which in turn lead to an overestimation in absolute values. Therefore we have changed the coefficients for SRB and LYA to the values allowing not so perfect result around 65 km in solar signal but also showing a good result in absolute values.

So the absolute values for parameterizations using full flux will be another parameters that one will have to consider trying to make fitting more mathematically. We just show the example.

We have changed all figures related to this and mentioned the way we estimate coefficients in the text.

List of relevant changes

1. Slightly changed section 2
2. Sufficiently rewritten section 3 with the inclusion of a new figure.
3. Slightly changed section 4.1
4. One reference added Fomichev (2009)
5. Several small corrections throughout the text