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Atmospheric Measurement Techniques Discussions

Interactive comment on "Atmospheric QBO and ENSO indices with high vertical resolution from GNSS radio occultation temperature measurements" *by* Hallgeir Wilhelmsen et al.

Anonymous Referee #4

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In this work, 4D fields of temperature obtained from the Global Navigational Satellite system (GNSS) are analyzed using the Principal Component Analysis (PCA) technique. The authors present two different methods of applying it, obtaining as a result, signals that fit with the known patterns of QBO and ENSO. I found this paper well written and easy to understand and I think that could be a good contribution to the use of satellite data, in this case, radio occultation vertical profiles.

I believe that this work could be accepted for publication after some revision.

- The authors applied two different methods in order to demonstrate the advantage of the high resolution of GNSS RO profiles. This result, according to lines 6-10 of page 9,

seems to be inferred from what the authors called reconstructed fields. I'm not sure if PCA methodology allows calling reconstructed patterns by multiplying the PC loadings by PC scores (see below). Please add some reference about it or explain this concept.

- PCA results change according to the input matrix and they can be different considering for example, a domain between 60 and 60. I think the authors should show some result or make some comparison.

- Perhaps calling PC loading fields to what authors called "EOF" and PC scores to the time series that they call "PC" it would be better, since it would agree with the common terminology for S-Mode in PCA (EOF).

- In my opinion there a too many figures. I'm not saying that they are needless, but perhaps they can be re-organized or so. In most of them you can find panels with more figures inside. As a result, it's hard to read the axis, the legends, etc.

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