

Interactive comment on “Baroclinic and barotropic instabilities in planetary atmospheres - energetics, equilibration and adjustment” by Peter Read et al.

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We are grateful to the referee for these comments and suggestions. We have implemented most of them in the text and figures, as indicated below, and will indicate changes to the text noted in blue in the new version of the manuscript.

Fig 7. from Young (2014) is incorrect for FZ: 2.08 to be replaced by 1.69

Now done. This was a typo, so thanks for pointing this out.

Fig.8. Please define the Peclet number Pe ($Nu-1$?)

Péclet number is indeed defined as $Nu-1$ (advective/conductive transport). This is now defined in the text.

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3.1 and Fig.9. Saturn and Jupiter do have super-rotation in the equator (and multiple jets, Note that Saturn "S" is missing in Fig.9) in contradiction with Fig.9. This part seems to suggest that only large Rossby numbers yield super-rotation: this is not what is observed. It might be the case that the authors mean "global (?)" super-rotation and arguing that one is within the PUMA realm but a comment on this would be very welcome.

Global super-rotation was intended in this discussion and a comment has been added to clarify this (with a reference to the review by Read Lebonnois 2018). We also note that Jupiter and Saturn have locally super-rotating equatorial jets, although the global super-rotation is not known for either planet. The reference (S) to Saturn in Fig. 9 has been added.

Figure 12. The arrow thicknesses must be consistent with their numerical values. The convention of using negative values is also misleading. Why not use positive values provided the arrows are in the right direction ?

Noted. We have now changed the convention to use positive numbers everywhere and have adjusted the thickness of arrows to be clearer.

12(a) NCEP data are used here: plz correct -0.48 to 0.48 since the arrow direction is in the opposite direction. Note that one should look at Boer and Lambert instead of Fig. 1 of Tabataba-Vakili et al. (pls correct text as well).

Number changed to positive in Fig. 12(a) and references are now entirely to Boer Lambert for these numbers.

12(b) pls refer explicitly to Fig.12 (b) in 4.1.2

Now added.

12(c): correct to positive values like in Lee and Richardson.

Done.

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