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Interactive comment on “Variability of the Brewer-Dobson circulation’s meridional and vertical branch using Aura/MLS water vapor” by T. Flury et al.

Anonymous Referee #2

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The brief article of Flury et al. presents interesting observational results, and actually I expected a different dependence of the BDC on the QBO. In so far I think the article is useful and contains a new observational-driven view on the BDC. In summary I think the paper can be published after some minor changes. However I like to introduce some critical points which may help to optimize the article.

1) I am a bit disappointed since the authors don’t succeed to explain the results theoretically. Why is the lower, meridional branch stronger during the QBO West phase (Fig. 12)? Actually I would expect that westerly wind plus Coriolis force would lead to a stronger mixing barrier at 20N. Maybe the authors can provide some physical ar-

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guments/ideas supporting Fig.12 ? E.g.: Is the increase of easterly wind during the ascent at the equator due to conservation of angular momentum at the equator?

2) Figure 3 shows zonal mean H₂O at 100 hPa level. I don't think that an air parcel moves on the 100 hPa level from the equator to the pole. The time difference in Figure 3 indicated by the arrows could be to another effect, e.g., vertical phase progression of the water anomaly?

3) The role of the troposphere is not discussed though it is known that the QBO and the BDC are driven by waves from below. In addition the stratospheric water anomalies (tape recorder) might be connected to meteorological phenomena such as the Asian monsoon.

4) In the conclusions the absolute value of the amplitude should be given too.

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