

Interactive comment on “3-D tomographic observations of Rossby wave breaking over the Northern Atlantic during the WISE aircraft campaign in 2017” by Lukas Krasauskas et al.

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The paper presents measurements of trace gases taken during a Rossby wave breaking event using the airborne limb sounding instrument GLORIA. This paper was discussed at the last meeting of the SPARC Stratospheric Dynamics journal club*. We thought that the methodology employed yielded interesting results and have summarised some comments that came up during our discussion. This is not a full review.

Overall comments: The figures have a high density of information and it was often difficult to find the specific features being referred to. This could be improved by highlighting the specific features, referring to them in the caption and adding a figure key in

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addition to the long descriptions in the caption. For examples in Figure 1, a figure key for the lines, dots and other contours would be useful.

Methods: Describe the FISH and FAIRO instruments. Where is PV data from? We assumed it was from the ECMWF operational analysis.

Figure 1: What do the yellow dots with black outlines along the limb view represent? Colours for the chemistry and dynamics mode could be more distinct. The yellow looks pale green.

Line 168: “O₃ and HNO₃ are more abundant in the stratosphere, where they are generated by photolysis” Is HNO₃ generated in this way? I thought it was photolysed into NO₂

Figure 4: The colour scale makes the air masses hard to interpret. Perhaps a different one would work better. We found the features being referred to such as the double mixing lines unclear. Annotations would be helpful too. Would it be possible to give a rough number of observations plotted in the caption for all such figures?

Figure 6 was hard to visualise. Would a rotated perspective work better? It would be good to also have latitudes and longitudes along the horizontal axes and to indicate the cross-sections from Figure 7 here.

Figure 8, label 165 W. We were also confused about how the calculation was done. Were the regions in Figure 7 (c) and (d) selected prior to doing the back trajectories or were they found after Figure 8 (a) showed that there were two groups of particles – red and black?

Line 311 - Where it reads 29 October, it should read 29 September.

Figure 9 (c) was not referred to in the text. Please describe what this figure shows.

— Alison Ming, Corwin Wright, Elio Campitelli, Inna Polichtchouk, Timothy Banyard, Annelize van Niekerk + 1 other

C2

*We are a group of about 25 members across about 12 different institutions. A subset of us meets every 2 weeks to discuss a paper.

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