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## ***Interactive comment on* “Residual circulation trajectories and transit times into the extratropical lowermost stratosphere” by T. Birner and H. Bönisch**

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We thank the reviewer for her/his valuable comments.

Please also see reply to reviewer 1 and supplement with revised and one added Fig.

Specific Points

Section 2:

P 16842, line 2 - We tested the trajectory calculations with daily fields of the residual circulation and the results are almost identical. This confirms the intuitive picture that the seasonal variations in the residual circulation are most important to be captured. A

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comment has been added to the revised manuscript to clarify.

P 16842, line 8 - the tropopause is the thermal tropopause everywhere, has been clarified

Section 3:

P 16843, line 14ff - we chose 1 year as in separating orders of magnitude (has been clarified), the precise value is not crucial for the discussion

P 16844, line 7 - our results based on ERA-interim are still in a preliminary stage (in large part due to data access issues - our analysis requires full model level data) which prevents us, at this stage, from showing ERA-interim results

P 16845, line 9 - in this case the value of AR  $\sim 1/1000$  is the one found for the range  $\sim 40$ -65 deg, over which AR does not change much. Poleward of 65 deg AR increases steadily.

P 16846, line 25 - done

Section 4:

P 16848, line 9 - "clear" has been removed (also at other places)

P 16860 - Fig. 9: an inference of the contribution of two-way mixing is something we plan to look into in the future

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 16837, 2010.

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