

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2022-159

Alison Ming (Referee)

Referee comment on "The impact of improved spatial and temporal resolution of reanalysis data on Lagrangian studies of the tropical tropopause layer" by Stephen Bourguet and Marianna Linz, Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-159-RC1>, 2022

Bourguet and Linz analyse the effect of different spatial and temporal resolution of ERA5 data on the cold point temperature distribution obtained using a Lagrangian transport model. They find that using a temporal resolution of 1h versus 6h is the primary contributor to the differences in cold point distribution with vertical resolution being of secondary importance. The paper is a thorough analysis of the effect of resolution on the cold point temperature and offers some explanations as to how to biases in temperature arise by examining how the trajectories sample the cold point.

Overall, the paper is well written and I only have a few minor comments detailed below.

It is unclear when you are using the DJF 2010 to 2019 integrations. Am I correct in thinking that most of the paper uses the 2017 integrations but the 2010 to 2019 integrations are in the supplementary material only? One suggestion would be to label (say A to G) the 7 experiments in Table 1 and use those labels in the figure captions.

Page 2 L24 Worth explaining the water vapor tape recorder in a bit more detail as it will help a reader who is unfamiliar with this region of the atmosphere to understand the subsequent discussion.

Page 4 L107 ERA5 + ERA5.1

Page 6 L147 I am confused. I thought that you were running the trajectory model on hybrid pressure levels but here you are initializing the trajectories on isentropic surfaces. Are you interpolating from isentropic levels to initialise or is the model using isentropic

levels?

Page 7 L167 Change 90 days to 3 months or vice versa for consistency

References: Please check your references carefully. There are various issues with the urls.
E.g. Line 366 and many others