

ACPD REVIEW

TITLE: Wave Modulation of the Extratropical Tropopause Inversion Layer
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Summary: This was a strong manuscript during the initial review and has been improved further in revision. The writing is very clear. The context of the effects of the TIL (Tropopause Inversion Layer) on wave propagation and transport issues is presented in the introduction. The GPS RO data description, averaging, and filtering is comprehensive and detailed. This paper examines the influence of waves on the middle latitude and polar tropopause TIL structure. Results show that most of the extratropical TIL variability can be explained by waves with 4–25 day periods. The need for further modeling and observational research to more precisely identify the wave structures, amplitudes, and origin are identified where appropriate in the text. Close to the pole, 80N, the waves are smaller scale and more difficult to identify. Nevertheless the seasonal changes at 80N and the difference season cycle between the polar regions and middle latitudes can be seen. Also noteworthy are figures illustrating downward propagation of stratospheric warming events as an additional factor influencing the polar TIL. The influence of radiation and radiative–dynamical feedback on the TIL is discussed as a likely mechanisms to explain the residual signal not captured by the GPS wave analysis. Overall this study makes excellent use of the high vertical resolution GPS observations to characterized the TIL.

Overall Recommendation:
Publish.