

## ***Interactive comment on “Tropopause altitude determination from temperature profiles of reduced altitude resolution” by Nils König et al.***

**Nils König et al.**

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**Comment:** *The paper by Koenig et al, addresses an important topic concerning the determination of the tropopause altitude from high resolution data using low resolution kernels. These have to be applied e.g. when comparing high resolution vertical data to satellite observations, when filtering oder interpolating data sets of different vertical resolution. The authors provide a systematic analysis using SHADOZ sonde data. They test for the effect of different resolutions (kernels) on the WMO lapse rate tropopause and cold point tropopause altitudes. They find, that the tropopause altitudes of the kernel weighted fine scale profiles differ significantly from the tropopause altitudes of the original data. Importantly they conclude that there is no correction scheme applicable to account for the displacement.*

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*The paper is sound and I regard it as highly relevant and recommend it for publication almost as it is. The authors could easily expand the scientific importance of their work by extending their analysis adding a systematic analysis of the cold point temperatures as well for different resolutions. Since the temperatures are crucial for the analysis of humidity transport, this would add another important aspect to this nice and important study.*

**Reply:** Excellent idea! This will be included in the revised version.

**Comment:** *Specific: It would be interesting to plot the cold point temperature in the same way as Fig. 7. Which implications does this have for the water vapor saturation mixing ratio?*

**Reply:** Plots of related cold point temperature will be shown. Implications for the water vapor saturation mixing ratio will be discussed.

**Comment:** *Why are the differences mostly negative with decreasing resolution (Fig 3, especially Fig. 7)?*

**Reply:** This is due to nonlinear shapes of the temperature profile, i.e., the profile is not fully described by the gradients above and below the tropopause.

**Comment:** *Technical: Are there differences in the kernels used in Fig.1 and Fig.6? If not, is Fig.6 necessary for the paper?*

**Reply:** After inclusion of additional results the selection of figures will have to be

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re-decided anyway.

**Comment:** *p. 11, line 6. "coaErse"*

**Reply:** Thanks for spotting.

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-448, 2019.