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Comment

## ***Interactive comment on “Combined wind measurements by two different lidar instruments in the Arctic middle atmosphere” by J. Hildebrand et al.***

**J. Hildebrand et al.**

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**page 4124, second and third sentence of Abstract**

We included the proposed phrases.

**page 4129, first sentence in Sect. 3: “33 s” instead of “33 ms”**

done

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## **page 4132, line 27 and Fig. 6: sign of wind speed differences, horizontal axes of wind speed plots**

We added signs to wind speed difference  $v_{\text{NWT}} - v_{\text{SET}}$ : "... differ ... by about  $+20 \text{ ms}^{-1}$  and  $-25 \text{ ms}^{-1}$  ...".

The upper panel (a) shows absolute wind speed. The scaling is chosen to cover the range of wind speed values between about  $-70 \text{ ms}^{-1}$  and  $50 \text{ ms}^{-1}$ . The lower panel (c) however shows wind speed difference. The scaling is chosen to have the same extent in negative and positive direction, to show also small amplitudes the extent is restricted to  $\pm 50 \text{ ms}^{-1}$ .

## **page 4136, final paragraph of Sect. 4.4: initial further discussion on possible explanation for the size of the derived scale height?**

This is an interesting issue. Since it seems to be much more complicated than our not completed analysis, we think it is beyond the scope of this manuscript.

## **page 4136, first paragraph of Sect. 4.5: wind speeds "match very well", but not in top altitudes 82–83 km**

We included this restriction in the manuscript.

## **page 4136, second paragraph of Sect. 4.5: time averaging of Fig. 10 and criterion for transition altitude between RMR and Na lidar**

The 1 h smoothing was applied to the data.

The criterion for the transition altitude between RMR and Na lidar data is to show in the height range of overlap the Na lidar data only. The wind speeds derived by Na lidar have smaller error bars:  $\approx 5 \text{ ms}^{-1}$  (Na lidar) vs.  $\approx 15\text{--}20 \text{ ms}^{-1}$  (RMR lidar).

## Fig. 10 and Fig. 12: color codes

The color codes for Fig. 10 and left panel of Fig. 12 is inspired by the colors of a rainbow. We use this color code since it is not the intention to highlight wind directions. In contrast in the right panel of Fig. 12 we want to emphasize the different signs of wind speed deviation, the minima and maxima of wavy structures. Thus we have chosen a color code which emphasizes the change of sign.

## page 4139, first sentence of Sect. 5: simultaneous measurements are continuous between 30 and 110 km but the common volume is only 80 to 85 km

We changed the sentence to the following: “We performed for the first time simultaneous wind observations using two different lidar instruments with the same line of sight, covering the altitude range of about 30 to 110 km, probing a common sounding volume between about 80 and 85 km altitude.”

## page 4140, line 6: referee dislikes the term “validation” in this context; it is more a “useful and meaningful comparison” of two techniques

We agree and replace “validation” with “meaningful comparison”.

## general comment: definition/explanation of terms “line of sight”, “meridional”, and “zonal”?

We will state at the first occurrence of “meridional wind” (“zonal wind”) in the manuscript that this denotes wind from west to east (south to north).

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Interactive comment on Atmos. Meas. Tech. Discuss., 5, 4123, 2012.

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