**Comment Editor:**

The updated manuscript has addressed the issues raised by the Reviewer. However, conclusions regarding the "added value" of including the meridional component in the calculation of the total speed should be more clearly explained.

**Answer Authors:**

Dear Editor, thank you for stating that the authors have essentially addressed all issues, leaving only one final point as a further clarification, which regards the "added value of including the meridional component v in the estimation of the total wind speed V", and asked for a comment back to you.

Our comment to this final point is:

We had already included an explanation to this end in the previous response to the Reviewer 2 but confirm, we did not bring this more specific explanation into the manuscript. We note that, related to the above statement, we have also checked for all 2.5° x 2.5° grid points within 5°S to 5°N and over all longitudes, how many grid points have the direction of v_o (original v-component) and v_eb (approximated by the eq. balance approximation) aligned (="same sign") vs how many don't agree ("opposite sign"). The result was that the approximation is not fully uninformative related to the v-component direction: we obtained in the mean over all 120 hPa to 800 hPa pressure levels, and over all twelve months of our 'test year' 2009, roughly ~55-60% same-sign grid points, but still in average >40% opposite sign. Hence it is somehow true that, while the (small) magnitude of the v-component is modeled reasonably, helping to compensate the slight underestimation of V_eb (the total wind speed) by the u_eb component alone in a good way [e.g, as Figure panels 2b,d vs. 2a,c show], the direction is not fully but mostly "noise-like", and therefore not viable to reconstruct a wind direction.

Based on this explanation, we weakened at some text places the wording of "benefit" or "added value" and added the following improvements in the manuscript text:

Line 10:

*"However, we still found a somewhat better agreement from including both components in the zonal-mean total wind speed in the troposphere."*

Line 16:

*"Overall, the study encourages the use of RO wind fields for meso-scale climate monitoring over the entire globe, including the equatorial region, and also showed a small improvement in the troposphere when including the meridional wind component in the zonal-mean total wind speed."*

Line 261:

*"This result indicates that while the meridional component itself is not well estimated, the calculation of the zonal-mean total wind speed shows a somewhat closer agreement from including also this small wind component in the troposphere. That is, the slight underestimation left by the zonal wind speed in the troposphere (see Fig. 3a,c) is mitigated by the inclusion of the meridional wind speed, which brings the approximated zonal-mean total wind speed closer to the original one (see Fig. 3b,d). The reason for this small co-benefit to the zonal-mean total wind speed is that the averaged meridional wind speed is estimated by the balance approximation at about the right (small) magnitude in the troposphere. However, in the stratosphere, the close-to-zero meridional wind brings in no further improvement. Nevertheless, we caution that, in addition to finding the meridional wind estimates not viable to benefit*

*also longitude-resolved wind speeds, we also find them not viable to reconstruct wind direction (i.e., wind vectors on top of wind speed estimates). The reason is that the direction of the approximated meridional wind at individual grid points is nearly as often found opposite as it is found aligned with the original wind direction.*"

Line 366:

*"Hence, a wind flow with small magnitudes and also changes in the direction of the flow (changing sign) is challenging to reproduce. We find in this respect the equatorial balance approximation not suitable for the reconstruction of wind directions and of longitude-resolved wind speeds in the troposphere."*

Line 384:

*"To summarize, we found encouraging results in that we revealed that RO data do indeed have good potential for long-term wind field monitoring over the complete globe, including across the equator. A meso-scale climate resolution (5° x 5° latitude x longitude grid) was possible to be demonstrated for the RO data in this specific region for wind speed, with evidence for added value from their accuracy and high resolution, as well as their long-term stability."*