

Atmos. Meas. Tech. Discuss., author comment AC5
<https://doi.org/10.5194/amt-2021-40-AC5>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Reply on CC4

Ryan Volz et al.

Author comment on "Four-dimensional mesospheric and lower thermospheric wind fields using Gaussian process regression on multistatic specular meteor radar observations" by Ryan Volz et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-40-AC5>, 2021

1. (Comparison to classical 2DVAR data assimilation) Sorry for the confusion, but we don't mean to say that the estimates are inherently done through 2D slices. The Gaussian processes are 4D, and the estimates at any point rely on all of the measurements in the manner described by the 4D covariance functions. In stating a 3 km vertical resolution, we mean to say that the covariance function we have used has a vertical length scale of 3 km, so that for any given estimate the measurements that contribute most strongly are within that vertical window. In this sense, one can think of the covariance function as having the effect of a type of soft binning.
2. (WGS84 geometry) We will be adding the Clahsen (2018) and Stober et al. (2018) citations in reference to the meteor processing in the revised manuscript, because the WGS84 aspect of the processing detailed therein is important enough to call out explicitly and not just transitively through Chau and Clahsen (2019). We appreciate the clarification.
3. (Vertical winds) The validity of the short-term vertical wind estimates is still an open issue; what we claim is that our method provides uncertainties on the estimates based on the geometry and error propagation. We appreciate the references provided, but all of them deal with climatological vertical velocity estimates. In any case, we will leave the validation of such vertical velocity estimates for a future effort.