Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., community comment CC3
https://doi.org/10.5194/amt-2021-40-CC3, 2021

Comment on amt-2021-40

Gunter Stober

Community 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-CC3, 2021

This is an interesting approach for multi-static meteor radar networks. Some part of the retrievals might deserve some additional information about the inversion method:

1. How does the method differ from a classical 2DVAR data assimilation approach applying a standard cost function? The inversion is computed layer-by-layer using a 'large vertical averaging'? However, the atmosphere shows very often strong vertical shears. Are these shears considered in the cost function or error estimates or both?

2. The algorithm makes use of the WGS84 geometry. It might be appropriate to cite the original paper and references of the implemented algorithms.

3. Retrieving vertical winds is usually challenging due to exponential instability growth for parameters with low measurement response. This often limits the vertical resolution for radiometers. Do they check the solutions for such instabilities? The values that can be found in the examples are rather high.