Supplement material:

The two panels below show the momentum fluxes obtained from the synthetic data. The synthetic wind fields were composed of mean winds, atmospheric tides, and planetary waves. The background wind was removed with the adaptive spectral filter technique (See Baumgarten and Stober, 2019, Stober et al., 2020). This filtering method permits to apply very long averaging of the gravity wave fluctuations without contamination due to a variable background, which increases the likelihood to capture small-scale vertical fluctuations correctly. The vertical wind velocity of the small-scale waves was increased/decreased with altitude and reached a maximum amplitude of about +/-10 m/s to visualize the sensitivity of the retrievals to changes in vertical wind fluctuations. The left panel shows the resultant momentum fluxes using the Collm spatial and temporal sampling. The right panel visualizes the same for Tierra del Fuego (TDF). The increased altitude coverage at TDF is due to the much higher power of the meteor radar. The gravity wave field is steady state.