We appreciate the reviewer's assessment of the paper. The aim of the manuscript is to present new algorithms and comparative data analysis to aid the use of a long-term archive of SuperDARN MLT wind data. The main elements of the paper are:

- Preparation and publication of a new 31-year archive
- First publication of a SuperDARN meteor wind algorithm
- First model of the meteor-altitude distribution for variable frequency, location and time of year
- Comparison of the new dataset against independent meteor radars and climatological reanalysis data.

We believe this is a scientifically important contribution given that 1) MLT wind observations are relatively scarce and 2) there are several recent publications making use of the SuperDARN wind product (see citations in the paper). The manuscript does not claim that SuperDARN winds are just as good as meteor winds - on the contrary it highlights the lack of height resolution and offers a means of mitigating that issue. However, given the relative abundance of this dataset, we argue that it is worthy of consideration as a supplementary dataset.

The review claims that "the correlation 0.49-0.88 between the SuperDARN and meteor radars cannot be considered as a reasonable agreement." We argue that the results are reasonable given that the radars are at different locations and operate on different frequencies. In the collocated case (MCM-MCM), the correlation scores were 0.73 and 0.88. The lower scores come from the HAN-AND comparison, where the radars are separated by 900 km great-circle distance. Categorization of correlation scores is a matter of debate, but these scores fall within typically accepted bounds for moderate to strong agreement. We note that the agreement was overall somewhat better for JAWARA vs meteor radars than for JAWARA vs SuperDARN.

1. "SuperDARN radars operate at HF frequencies 8 to 22 MHz, whereas frequencies of meteor radars are typically above 30 MHz. Could it affect the Doppler velocity measurement?"

The line-of-sight velocity is obtained using the standard monostatic radar Doppler relation,

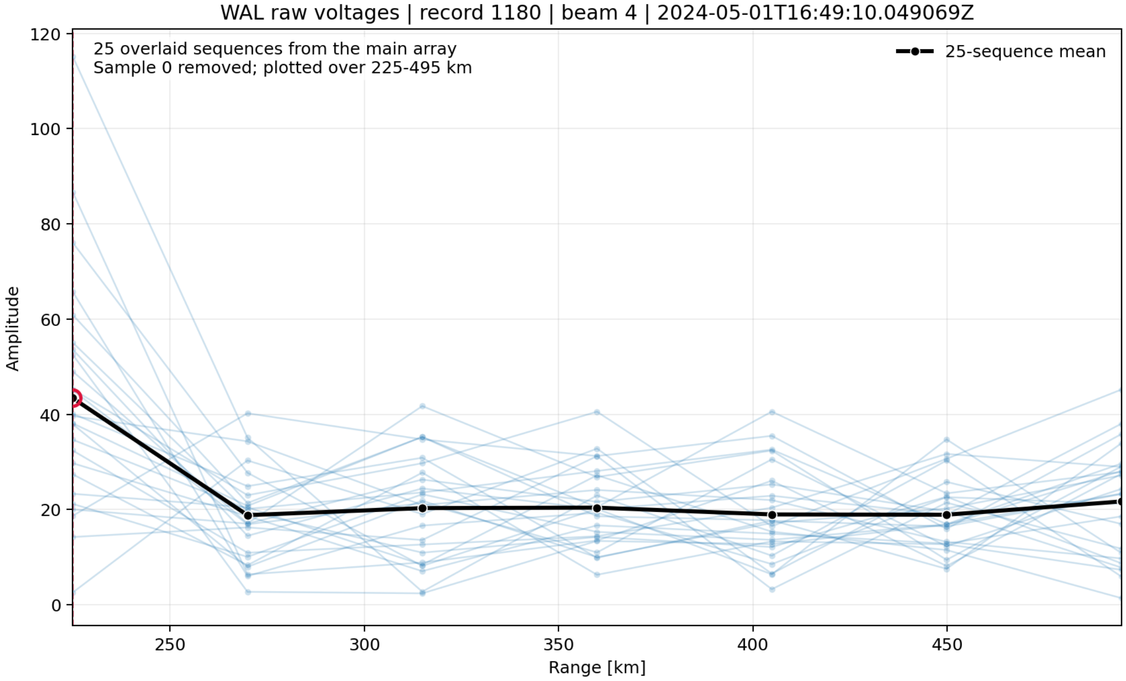
$$v_r = -\lambda f_D/2,$$

in which the radar wavelength, λ, is explicitly included. Therefore, the different operating frequencies of SuperDARN and conventional meteor radars do not introduce a Doppler velocity scaling error, although they do affect the meteor population and altitude distribution sampled by the radars.

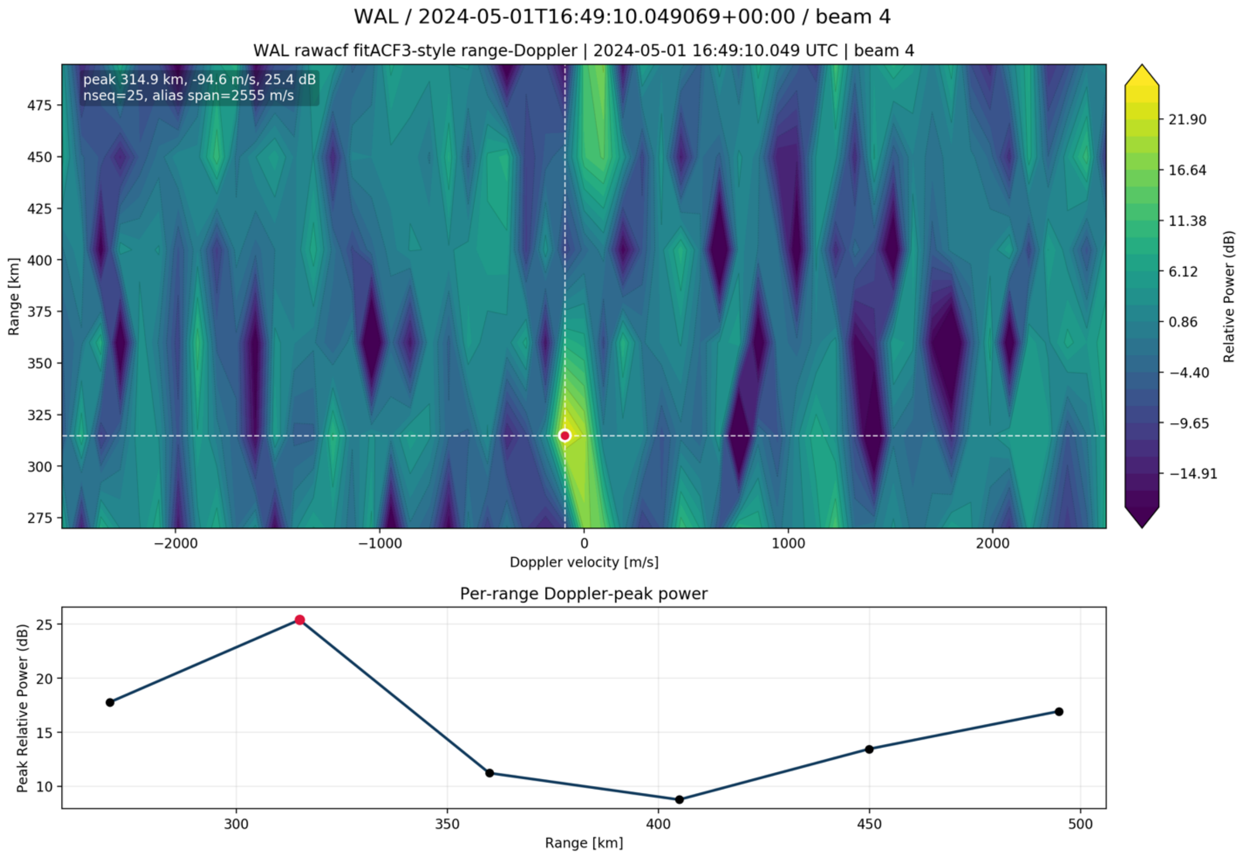
The manuscript does address those related points. For differences in altitude distribution, sections 2.2 to 2.6 describe the construction of a new meteor count model that is used to compensate for the differences in altitude distribution. Section 3.1 provides an assessment of that new model. For differences in observed meteor populations at different frequencies, on lines 308-309 of the discussion the manuscript explicitly proposes a new SuperDARN operating mode that combines high range resolution in the relevant range-gates with multi-frequency sounding.

2. “SuperDARN radars are sensitive to all kind plasma irregularities. It may be good to show some examples of the signals (voltage) of what is interpreted as a meteor. They may be overdense, or underdense, or something else.”

We believe this would not be useful as the standard SuperDARN mode does not have the range resolution to distinguish these. The raw voltage is not useful in identifying a meteor echo without match filtering. Below is an example that illustrates this, for a meteor case.



This figure shows the real amplitude of the received voltage for 25 pulse sequences. There is no obvious peak here. The next figure shows that the signal processing finds a clear range-Doppler peak of ~95 m/s that is interpreted as a meteor in the SuperDARN data analysis.



Given the SuperDARN archive consists of ‘rawACF’ files, we cannot generally use raw voltage waveforms or trail decay times to classify individual echoes as underdense or overdense. This is a limitation of the historical product.

We have added to the manuscript the following caveat:

“The standard SuperDARN product does not classify individual echoes as underdense or overdense. It instead relies on statistical and geometric selection of near-range echoes rather than on an event-by-event physical classification of each trail.” We note again that this interpretation of near-range SuperDARN echoes as meteor scatter follows earlier SuperDARN meteor-echo and meteor-wind studies, beginning with Hall et al. (1997), and subsequent applications to MLT tides and planetary waves.

3. “Fig 8 and Fig 9 show that SuperDARN winds seem to be systematically larger than the meteor radar winds. As described in Section 2.1, echoes flagged as ground scatter are excluded. Hence, meteor echoes with small line-of-sight velocity might be rejected as ground scatter. Could it be a reason for the overestimated wind velocity?”

We agree that the exclusion of echoes flagged as ground scatter could, in principle, introduce a bias if meteor echoes with small line-of-sight velocities were preferentially removed. However, this is not what we find in the validation comparisons. In three of the four SuperDARN–meteor-radar comparisons, the regression slope was less than 1 when SuperDARN winds were compared against the meteor radar winds: both wind components for HAN–AND and the meridional component for MCM–MCM. This indicates that, in these cases, the meteor radar data exhibited a larger dynamic range than the SuperDARN data, contrary to what would be expected if the SuperDARN winds were systematically inflated by removal of low-velocity echoes. Similarly, the JAWARA comparison showed a larger range of variability than SuperDARN in all analyzed cases.

We have also clarified that the fitACF v3 ground-scatter classification is not based on a simple line-of-sight velocity threshold. Instead, the classification depends on both Doppler velocity and spectral width. In fitACF v3, the ground-scatter parameter is defined as

$$g = | V | - 30 - \frac{30}{90} | W |,$$

with uncertainty

$$g_{\mathrm{err}} = \sqrt{V_{\mathrm{err}}^2 + \left(\frac{1}{3} W_{\mathrm{err}}\right)^2},$$

where V is the line-of-sight Doppler velocity, W is the spectral width, and V_{err} and W_{err} are the corresponding fit uncertainties. Echoes are flagged as ground scatter when

$$g - g_{\mathrm{err}} \leq 0.$$

Therefore the classification depends on both Doppler velocity and spectral width. We have added this clarification to the manuscript, but the proposed systematic overestimation is not evident in the comparisons with independent wind products.