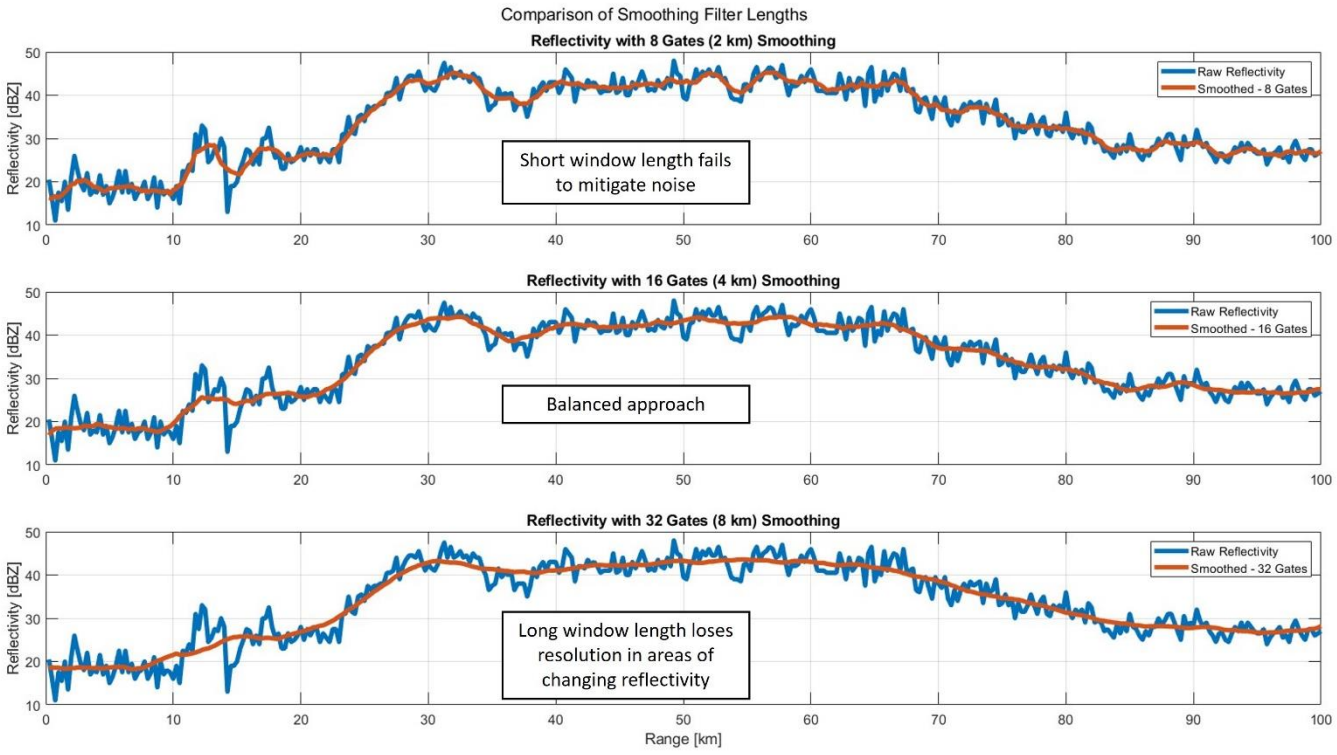
Thank you for your question regarding our manuscript.

In selecting the smoothing window length for our study, we carefully considered the trade-offs between resolution and noise reduction. A longer smoothing window, while beneficial for reducing noise and bias, can adversely affect the resolution, leading to a loss of detail in the radar data. Conversely, a shorter window may not effectively mitigate these noise and bias elements, compromising the quality of the data.

Since there is no standard for filter length with respect to variable smoothing, we referenced the specific differential phase calculation methods utilized by Ryzhkov[1] which employ window lengths of 9 gates (2.25 km) and 25 gates (6.25 km). We opted for an approximate average between these two values in our analysis. This decision was based on the observation that within this range, the smoothing effect remains relatively stable against minor variations in the filter length.

However, it's important to highlight that window lengths exceeding 25 gates can lead to over-smoothing, potentially obscuring critical features in the radar data. Similarly, window lengths shorter than 9 gates might not be sufficient to effectively reduce noise. Thus, our chosen average aims to strike a balance, ensuring both adequate noise reduction and preservation of important radar data characteristics. This is easily seen in the following example from our dataset.



[1] A. V. Ryzhkov, S. E. Giangrande, V. M. Melnikov, and T. J. Schuur. Calibration issues of dual-polarization radar measurements. Journal of Atmospheric and Oceanic Technology, 22(8):1138–1155, 2005. doi: 10.1175/jtech1772.1.