

Interactive comment on “Seasonal evolution of winds, atmospheric tides and Reynolds stress components in the Southern hemisphere mesosphere/lower thermosphere in 2019” by Gunter Stober et al.

Anonymous Referee #2

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Reviewer comments:

This paper describes an approach to obtain wind variances and momentum fluxes. In which an adaptive spectral filter has been used to perform the Reynolds decomposition into a background flow and the GW fluctuations. The authors have used winds obtained during 2019 by 6 meteor radars from middle to polar latitudes in southern hemisphere. To reduce the meteor altitude uncertainty, a full earth geometry was implemented, which maximize the observed number of meteors in the analysis. The topic covered in the manuscript is important as it contributes to improving the momentum flux and

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variance estimates in MLT region winds. The arguments used to interpret the results are not clear and sometimes not convincing. The scientific contribution is appropriate for this journal. However, there are some issues that need to be addressed.

Comments:

In the "Introduction", some sources of secondary gravity waves have been emphasized, so it was expected that the authors would also explore this knowledge in the results as well as in the discussion. In this sense, there is a lack of enough discussion about this topic. Some parts of the description of the Reynolds stress results are confusing. For example:

Line 399 - "In Particular, at KSS a variable zonal momentum flux is measured that seems to be in better agreement with TDF and ROT results". For me, it is hard to see a better agreement among KSS and TDF/ROT results, from Figure 8.

Lines 404-405 - For the "results from KSS and KEP show a good agreement of the vertical structure ...", from the Figure 8, I can see that a good agreement occur above 90 km.

Lines 405-407 - where appear "Results from ROT and DAV still reflect some features of the seasonal meridional momentum flux behaviour," again, from the Figure 8 it is possible to see that KEP "still reflect some features of ..." - instead of DAV.

Discussion should be made more rigorous. The basis for these statements need to expand further, considering the stratospheric and MLT winds (Figures 10 and 2) to explain the momentum flux components and variations observed (Figures 8 and 9). What configurations are expected for momentum flux in face of the observed stratospheric and MLT winds?

Technical revision

Line 23: Change (Fritts and Nastrom (1992) by "Fritts and Nastrom (1992)" Line 26: "ch" and "Uh" don't seem necessary. Lines 398-399: change "In Particular, at KSS a" by

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“In particular, at KSS a” Lines 471 and 473: it is unnecessary to use the acronym USLM
Line 496: change “structure Becker and Vadas (2018) with” by “structure (Becker and Vadas, 2018) with”

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