Ann. Geophys. Discuss.,
https://doi.org/10.5194/angeo-2018-17-RC1, 2018

Annales Geophysicae Discussions
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Interactive comment on "Seasonal variability of atmospheric tides in the mesosphere and lower thermosphere: meteor radar data and simulations" *by* Dimitry Pokhotelov et al.

Anonymous Referee #1

Received and published: 9 March 2018

Review on paper

Seasonal variability of atmospheric tides in the mesosphere and lower thermosphere and lower thermosphere: meteor radar data and simulations

by

Dimitry Pokhotelov, Erich Becker, Gunter Stober and Jorge L. Chau

This paper deals with a comparison of the measured amplitudes of the semidiurnal tides in the horizontal winds (zonal and meridional) obtained as an average annual behavior from 75- to 110 km altitude at two stations with the simulated results of the

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Discussion paper

Kühlungsborn Mechanistic Circulation Model (KMCM). Two long wind data series obtained by Meteor Radar at a mid-latitude site Juliusruh, Germany (54o N, 13oE) for nearly 10 years and at a high-latitude site Andenes, Norway (69oN, 16oE) for nearly 14 years are used to extract the tidal components. It is said that a novel adaptive filter method is used for extracting the tidal components from the data series and that the same treatment is applied to the model run results. The authors claim to demonstrate that the model provide reasonable representation of the tidal amplitude and concludes that the coarse spatial resolution model version of KMCM can be used to dynamically force an ionospheric model. The paper is concise, well written and logically consistent and can have interest to Annales Geophysicae readers. However, this reviewer has some concerns about the comparisons presented and their interpretation. Therefore, major revision is needed before its publication. The main concern refers to the way in with the similarities are stressed (referring to the comparison of figures 1 and 2 with figures 3 and 4) and the differences are minimized. Although the main characteristic of the seasonal variation of the amplitudes of semidiurnal tides are captured by the model it is only said that "The main difference between the observed and simulated behaviour is that the model predicts strong amplitudes around 80-85 km in summer months, which is not seen in the observations". A simple analysis of the figures show that the model simulation shows an enhancement on April-May in all altitudes and enhanced amplitudes above 85 km from May to September in mid-and high-latitudes which are not observed on data. There is no discussion how this drawback could affect the use of this conventional model setup to analyze tidal impact in the ionosphere. Technical corrections: Abstract and Page 2, line 19: A "novel" method. This word causes an impact, but as shown in the paper, the method has already been described in a previous work. Page 2, line 2. The footnote 1 is dispensable. Page 2, line 25: The whole meaning of IAP should be described. Page 2, line 25: ..has been continuously... Page 2, lines 31,32. Better put in text that the used method is given by Stober et al., 2017. Page 3, line 27: .. strong amplitudes around 80-85 km in summer months... We can not see this. See special comment above.

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Discussion paper