Review of the manuscript

"Semidiurnal solar tide differences between fall and spring transition times in the Northern Hemisphere"

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General Comments:

This paper is dedicated to research of semidiurnal solar tide (S2) behavior during the fall and spring transition times in Northern Hemisphere. Radar wind measurements by three meteor radars located at different mid-latitude sites have been used to investigate above-mentioned tide. It is observed an evident decrease of S2 during every autumn while the time of the decrease occurrence varies from year to year. There is the spring decrease as well but it is not so sudden. The next task that has been performed is to assess the contributions of different semidiurnal tidal components. To solve this problem the Hamburg Model of the Natural and Ionized Atmosphere (HAMMONIA) has been used. It is obtained that during the fall both migrating (SW2) and non-migrating westward propagating (SW1) semidiurnal tidal components decrease during the fall. During the spring, they behave in different ways. The observed behavior of the total semidiurnal tide S2 is mainly driven by superposition of SW2 and SW1 components. This is a good paper, which provides the readers with new information on the seasonal variations of semidiurnal tides. I believe that it will be accepted for publication in Ann. Geophys. after minor revision without an additional review.

I recommend that authors consider the following comments when revising the manuscript.

Specific Comments:

Page 2, lines 1-2: It should be noted that another possible source of non-migrating tides is a nonlinear interaction between migrating tides and stationary planetary waves (SPWs). The results obtained demonstrate that during seasonal transitions the SW2 and SW1 changes simultaneously. This fact indicates that they are not independent and connected through the nonlinear interaction with SPW1. It would be useful to include a short discussion of this possibility in the conclusion.

Page 3, line 5 and page 6, line 4: It is not clear why the different windows in analysis of measurements (21-days) and when the authors investigate the tides and planetary waves (30 days) have been used. The observations show a strong intra-seasonal variability of atmospheric tides and it is not correctly to use different bins in the analysis. For a future, I would like to suggest the complex Morlet wavelet transform to investigate the intra-seasonal variability of atmospheric tides.

Page 6, line 12: It would be useful to explain shortly the difference between the total semidiurnal tide (S2) and SW2+SW1 (at least when we consider the results of simulation).

Technical corrections:

Page 2, line9 and page 10, line 17: It is better to use "time interval" instead of "time period".