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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Semi-annual oscillation (SAO) of the nighttime ionospheric D-region as detected through ground-based VLF receivers" *by* I. Silber et al.

Anonymous Referee #2

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General remarks This paper describes VLF observations in two mid latitude stations of the semi-annual oscillation in the D region of the lower ionosphere and suggests that NOx molecule transport from the lower atmosphere to the night time D region could be at the origin of this oscillation. Such VLF observations are new and could be worth for publication in ACP journal. However, some parts of the paper could be improved taking into account the following remarks:

The abstract and conclusion claim that NOx transport modulates the SAO signature in VLF measurements. The different possible origins of the observed effects are examined in chapter 4 integrating i) a short discussion about dynamical transport of neutral

species, ii) a comparison with satellite measurements to research the origin of phase differences observed in the VLF data recorded by both stations, iii) a short analyze of possible tidal effects which could explain the observed results and amplify the SAO signature. However, conclusion is lacking about the quantification of the different processes.

The paper general conclusion claiming that the NOx molecule transported from the upper level of the atmosphere produce enhanced ionization in the night time D region is interesting but this is not demonstrated. A comparative study of the different processes examined in chapter 4 could significantly improve the paper.

The VLF and satellite comparison is interesting and should be better analyzed.

Suggested technical corrections - Some parts of the text could be improved. For example: Page 12, lines 24 to 28; Page 14, lines 16-20. - The quality of the Figures could be improved. The size of the characters is too small.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 30383, 2015.