Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2019-1196-RC1, 2020
© Author(s) 2020. This work is distributed under
the Creative Commons Attribution 4.0 License.

Atmospheric Chemistry and Physics Discussions

Interactive comment on "A plasmachemical axially symmetric self-consistent model of daytime sprite" *by* Andrey Evtushenko et al.

Anonymous Referee #2

Received and published: 5 May 2020

This paper in on sprite modeling in daytime conditions using a self-consistent axially symmetric plasmachemical model. The authors have first given a good background and observational evidence of nighttime sprites which high frequency of their occurrence. They have then explained the difficulty with direct observations of the daytime sprites and their less frequent occurrence because of requirement of large impulse charge moment (ICM). They have also given the references of indirect evidences of daytime sprites. The authors have done the simulation for two values of ICM of 2750 C_km and 3750 C km with the radius discretization step of 1 km and the altitude discretization step of 1 km which is a reasonable consideration at a reduced height by 20 km as compared to nighttime sprites which I consider technically valid hence results and conclusions are sound

I just have two corrections and additions to be made:

1. Lines : "Similar pattern of the magnetic field evolution was observed in daytime and is presumably related to sprites (Kumar S., 2008)". I suggest authors to read this article and rewrite again appropriately as there were daytime VLF perturbations observed from Electric field measurements of VLF subionospheric waves from navigational transmitters not the magnetic field.

2. Lines 132-133: "Indirect data from the WWLLN show that events with currents of more than 300 kA occur quite often (Holzworth R.H., 2019)". I suggest here to cite at least these two following relevant studies have used GLD360, WWLLN and NLDN data .

âĂć Salut, M. M., M. Abdullah, K. L. Graf, M. B. Cohen, B. R. T. Cotts, and S. Kumar (2012), Long recovery VLF perturbations associated with lightning discharges, J. Geophys. Res., 117, A08311, doi:10.1029/2012JA017567. âĂć Salut, M. M., M. B. Cohen, M. A. M. Ali, K. L. Graf, B. R. T. Cotts, and S. Kumar (2013), On the relationship between lightning peak current and Early VLF perturbations, J. Geophys. Res. Space Physics, 118, doi:10.1002/2013JA019087.

I am then happy to recommend the publications of this paper.

Please also note the supplement to this comment:
https://www.atmos-chem-phys-discuss.net/acp-2019-1196/acp-2019-1196-RC1-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2019-1196, 2020.