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Comment on angeo-2021-15 ionosonde papers and proton precipitation

Harold Knight

Community comment on "Validation of SSUSI-derived auroral electron densities: comparisons to EISCAT data" by Stefan Bender et al., Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2021-15-CC1>, 2021

Please cite two recent papers comparing SSUSI and GUVI FUV-derived ionospheric E-region data products with ground-based ionosonde observations:

Knight, H. K., Galkin, I. A., Reinisch, B. W., and Zhang, Y.: Auroral ionospheric E region parameters obtained from satellite-based far ultraviolet and ground-based ionosonde observations: Data, methods, and comparisons, J. Geophys. Res., 123, 6065–6089, <https://doi.org/10.1029/2017JA024822>, 2018.

Knight, H. K.: Auroral ionospheric E region parameters obtained from satellite-based far-ultraviolet and ground-based ionosonde observations – effects of proton precipitation, Ann. Geophys., 39, 105–118, 2021.

The first paper shows good overall agreement between ionosonde and FUV-derived NmE. The second paper shows that proton precipitation does not introduce a bias into FUV-derived NmE, which is an important result for auroral FUV remote sensing. Your paper should mention that, while auroral FUV algorithms assume pure electron precipitation, much of the total precipitation (in terms of energy flux) results from proton/ion precipitation.