

Interactive comment on “Auroral ionospheric E region parameters obtained from satellite-based far ultraviolet and ground-based ionosonde observations: Effects of proton precipitation” by Harold K. Knight

Anonymous Referee #1

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In this paper, the E-region electron density estimated from auroral far ultraviolet (FUV) is compared with that observed with ionosondes. The obtained results could contribute to studies of aurora and ionosphere. Therefore, this paper is worth publishing in this journal. However, the following comments need to be addressed before its publication.

- II. 141-142: Does "local equilibrium" means the equilibrium between the ionization and recombination rates of plasma in the E region? If so, it is better to describe so.
- II. 143-144, "electron density is approximately proportional to the square root of the

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sum of squares of electron densities that would result from two different sources of ionization (i.e., electron and proton aurora, in this case)":

This explanation seems strange. If production rates of the ion by electron and proton aurora (q_e and q_p , respectively) is balanced with the recombination rate ($a \cdot n^2$, where a is a coefficient and n is the electron density), we can describe as $q_e + q_p = a \cdot n^2$. Then, $n = 1/a \cdot \sqrt{q_e + q_p}$. Does the author consider that q_e and q_p are proportional to square of electron density?

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