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## Effective energy loss per electron-ion pair in proton aurora

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**Abstract.** Effective energy loss per electron-ion pair produced,  $\langle xi\rangle(E_0)$ , as a function of a particle's initial energy has been obtained for proton transport in the atmosphere. The influence of some transport parameters on the shape of  $\langle xi\rangle(E_0)$  has been studied. Comparisons with the case of electron transport and with other results were made. It has been shown that: 1. for  $E_0 > 1$  keV,  $\langle xi\rangle(E_0)$  varies within the range 30-36 eV; 2. as  $E_0$  increases the value of  $\langle xi\rangle(E_0)$  tries to attain an asymptotic value that is the same as for electrons (\approx35 eV); 3.  $\langle xi\rangle(E_0)$  strongly depends on the average energy of secondary electrons, but the energy distribution of secondary electrons is not as important. The range of possible changes in  $\langle xi\rangle(E_0)$  associated with discrepancies in cross sections has been obtained.

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