Calculations of Electronic Stopping Cross Sections for Low-energy Protons in Water

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Calculations of electronic stopping cross sections for low-energy protons were performed using available interaction cross-sections and information on the mean energy loss per collision. The results were compared with published stopping power data to assess the general consistency and reliability of the results. The calculated stopping cross sections include contributions from excitation by both the proton and neutral-hydrogen components of the charge-equilibrated beam and the mean energy lost per interaction. The calculated electronic stopping cross sections for swift charge-equilibrated hydrogen particles in water are in agreement with previous tabulations of stopping power to within 20% (approx.) for particles energies less than 0.3 MeV.