

EXCITED-STATE SUBSHELL POPULATION OF HYDROGEN ATOMS AFTER TRANSMISSION OF RELATIVISTIC H⁻ IONS THROUGH THIN FOILS¹

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A theoretical study of the transmission of relativistic H⁻ ions through thin carbon foils for a broad range of beam energies is presented. The study is based on a Monte Carlo solution of the Langevin equation describing electronic excitations of the atoms during the transport through the foil. Calculations are presented for the subshell populations of outgoing hydrogen atoms, and it is shown that there exists a propensity for populating extreme Stark states. The results are found to be in good agreement with recent experimental data. The effect of a laboratory magnetic field on the population dynamics is analyzed.

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