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Positron mass stopping powers in atomic and molecular hydrogen[1] DMITRY FURSA, RAVSHAN UTAMURATOV, NICOLAS MORI, ALISHER KADYROV, IGOR BRAY, Curtin University, MARK ZAMMIT, Los Alamos National Laboratory — In quantifying the collision processes, the particular quantity of interest is the stopping power (SP), because of its use in modeling projectile transport through matter. Many applications require accurate SP values at low and medium energies to model the projectile's entire path, however it is significantly inhibited by the lack of reliable experimental and theoretical data. The SP calculations used to date are mostly based on high-energy approximations combined with the Bragg's additivity rule for molecules. Both approaches need careful checking at low and intermediate energies where an accurate account of channel coupling effects is important. In this report, we present results for positron impact electronic excitations and the SP of atomic and molecular hydrogen calculated using the convergent close-coupling (CCC) method. Our results cover low to high energy range and explicitly include Ps formation and a large number of target excitation and ionization channels. We check Bragg's additivity rule both for positron and electron projectiles by comparing results for atomic and molecular hydrogen.

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Dmitry Fursa
Curtin Univ of Technology

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