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Manipulating state-selective charge exchange in laser-assisted collisions of He^{2+} with atomic H[1] F. JAVIER DOMÍNGUEZ-GUTIÉRREZ, R. CABRERA-TRUJILLO, Instituto de Ciencias Físicas - Universidad Nacional Autonoma de México — We solve the time-dependent Schrödinger equation within a finite-differences approach and the propagation Crank-Nicolson method to calculate the n = 2, 3, and total electron capture cross section of He^{2+} colliding with atomic H in the energy collision range 0.25-35 keV/amu. We use a laser pulse of 3, 2, and 1 fs at FHWM, wavelength of 800 nm and intensity 3.15 $\times 10^{12}$ W/cm^2. We demonstrate that the laser assistance in the collision increases an order of magnitude the electron charge capture in the 0.25-2 keV/amu energy collision range. We compare our numerical results with those obtained experimentally for the laser-free case to asses the validity of our method. Also, we study the effect of the laser pulse in the excitation cross-section for n =2 states of the hydrogen atom and the dependence of the charge exchange as function of the FWHM of the laser pulse.

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