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Double-slit interference in H_2^+ subjected to ultrashort x-ray radiation[1] ETHAN SECOR, XIAOXU GUAN, KLAUS BARTSCHAT, Drake University, BARRY I. SCHNEIDER, National Science Foundation — Extending our earlier work [1], we consider the double-slit interference effect [2,3] in the H_2^+ ion irradiated by intense short x-ray laser pulses with central photon energies from 200-500 eV. The time-dependent Schrödinger equation in prolate spheroidal coordinates is solved to extract the angle-differential cross section of the photoelectron. The spatical coordinates are discretized by means of a finite-element discrete-variable representation. We discuss the confinement effect [3] in the parallel geometry, in which the emission mode of the photoelectron along the laser polarization direction is dynamically forbidden. This confinement appears periodically, with the details depending on both the momentum of the electron and the internuclear separation. On the other hand, the effect disappears in the perpendicular geometry. We compare our results to those obtained from a simple plane-wave model based on time-independent perturbation theory.

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[3] J. Fernández, F. L. Yip, T. N. Rescigno, C. W. McCurdy, and F. Martín, Phys. Rev. A **79** (2009) 043409.

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