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Circular Dichroism in Laser-Assisted Proton – Hydrogen Collisions[1] THOMAS NIEDERHAUSEN, UWE THUMM, James R. MacDonald Laboratory, Kansas State University, Manhattan, KS 66506-2604, USA — We theoretically investigate the effects of a strong circularly polarized laser field on the electron dynamics in proton–hydrogen collisions. We compare results for two classical trajectory models that include either two or all three degrees of freedom of the electron and assess dimensionality effects. In the 2D model the electron is restricted to move in the scattering plane that also contains the laser electric field [1]. We study the dependence of the electron capture and ionization probability on laser (intensity, laser phase at collision time) and projectile parameters (impact parameter). We provide new 3D ab-initio results for capture and ionization, exhibiting a strong dependence on the initial laser phase and the impact parameter. We find that charge-resonant enhanced ionization at larger impact parameters for the collision reaction is strongly phase dependent.
[1] T. Niederhausen, B. Feuerstein, and U. Thumm, Phys. Rev. A **70**, 023408 (2004).

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