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Subcycle interference dynamics of ultrafast photoelectron holography, UPEH, and its applications in molecular imaging XUEBIN BIAN, ANDRE BANDRAUK, Universite de Sherbrooke — Ultrafast photoelectron holography, UPEH, is studied by solving a 3-D time-dependent molecular Schrödinger equation and a corresponding classical model. We report subcycle interference dynamics between direct and rescattered photoelectrons. Four different interference patterns are predicted by the classical model, and used to interpret the quantum simulations, involving forward and backward rescattering in above threshold ionization (ATI). The numerical simulations provide attosecond time-resolved tools for the electronic imaging of molecular structure [1]. Dynamic imaging of a linear symmetric molecule H_2^+ and dipolar molecule HeH^{2+} are studied as examples.

[1] Xue-Bin Bian and Andre D. Bandrauk, Phys. Rev. Lett. 108, 263003 (2012).

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