

Abstract Submitted
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Ultrafast Electron Pulse (e,2e) Processes¹ HUA-CHIEH SHAO, ANTHONY STARACE, University of Nebraska-Lincoln, U.S.A., LARS MADSEN, Aarhus University, Denmark — Techniques for producing ultrafast electron pulses have been proposed² and prospects for using such pulses to image electron dynamics in the H atom and the hydrogen molecular ion have been theoretically demonstrated.³ The (e,2e) process provides a means to directly image the momentum distribution of the target.⁴ We explore here the possibility of observing the time dependence of a coherent superposition of target orbitals by means of the (e,2e) process with ultrafast incident electron pulses. Using scattering theory for a longitudinally coherent beam,⁵ we find that the momentum distribution of a coherent state of the H atom can be retrieved.

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