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Dissociative ionizaiton of H_2 in an ultroviolet pulse train and delayed infrared laser pulse[1] FENG HE, UWE THUMM, James R. Macdonald Laboratory, Kansas State University — The ionization of H_2 in a single attosecond XUV pulse generates a nuclear wavepacket in H_2^+ which is entangled with the emitted photoelectron wavepacket. The nuclear wavepacket dynamics can be observed by dissociating H_2^+ in a delayed infrared laser pulse. If H_2 is ionized by a sequence of XUV pulses of an attosecond pulse train, whether or not the corresponding sequence of nuclear wavepackets in H_2^+ is detected as a coherent or incoherent superposition depends on whether and how the photoelectrons are observed. We simulate the nuclear dynamics in this XUV pump - IR probe scenario and analyze our numerical results, suggesting that interference between coherently launched nuclear wavepackets in H_2^+ can be neglected in the recent experiment of Kelkensberg *et al.* [**103**, 123005 (2009)].

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