Abstract Submitted
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Optimal wavelength for carrier-envelope phase effects in H_2^{+1}
SHUO ZENG, BRETT ESRY, Kansas State University — We have solved the time-dependent Schrödinger equation for the benchmark molecule H_2^+ in intense, few-cycle laser pulses over a broad wavelength range from 800 nm to 2000 nm. We extract the momentum distribution of the p+H fragments following dissociation, focusing on the carrier-envelope phase (CEP) effects. The calculations include all degrees of freedom but neglect ionization. We interpret the wavelength dependence of the CEP effects using our previously developed Fourier-Floquet framework [1,2]. We find that longer wavelengths yield stronger CEP control and that there is a range of wavelengths that produce a relatively intensity-independent asymmetry pattern. This feature ensures that more of the CEP effects will survive the focal volume averaging over the laser intensity profile that is largely unavoidable in experiments. Different cuts through the laser parameter space will be used to highlight different aspects of the physics.

[1] V. Roudnev and B. D. Esry, Phys. Rev. Lett. 99, 220406 (2007)
[2] J. J. Hua and B. D. Esry, J. Phys. B 42, 085601 (2009)

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