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Strong-field-induced dynamical rotation and ionization of HeH+

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Strong-field-induced rotation and ionization of HeH+ are investigated. The nuclei are treated as classical trajectories moving on field-dressed potential energy surfaces, while single and double ionization are simulated as stochastical jumps to the ionic surfaces, using the internuclear-distance- and orientation-dependent static ionization rates obtained from many-electron weak-field-asymptotic theory (ME-WFAT). The laser-induced dynamical rotation is found to be crucial for the detected angular distribution of the nuclear fragments, with the orientation-dependent ionization rate taking a less important role. Interestingly, there is a critical internuclear distance where dynamical rotation is especially important. Temperature, isotope and pulse duration effects are investigated, and comparison with experiment is performed.

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