Abstract Submitted
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Classical Ensemble Studies of Double Ionization at 390 nm[1] S.L. HAAN, Z.S. SMITH, Calvin College — An ensemble of 400,000 classical 3d atoms is employed to investigate double ionization of helium for laser wavelength 390 nm and intensity 1.1PW/cm^2. It has previously been shown by Parker *et al.* [1] that electrons of energy above $2U_p$ are produced under these conditions. Such electrons are also produced in the classical model. Trajectories which lead to energy above $2U_p$ are analyzed and shown to have a median time delay of 0.56 cycle between recollision and final ionization, with over 99% having time delay of at least 0.16 cycle. Two characteristic recollision sequences are presented in detail, one of which can be described as excitation-backscatter-escape and the other as recapture ionization with prompt nuclear scattering. It is shown how the nuclear and laser forces combine in each case to give an electron–usually the struck electron–final energy above the usual $2U_p$ cap. [1] J. S. Parker, *et al.*, Phys. Rev. Lett. **96**, 133001 (2006).

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