

Abstract Submitted  
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**The Ultimate Energy Limit of HHG and Strong Field Rescattering**<sup>1</sup> BARRY WALKER, University of Delaware, MICHAEL KLAIBER, KAREN HATSAGORTSYAN, Max-Planck-Institut für Kernphysik, JIAN WU, East China Normal University, SUI LUO, PATRICK GRUGAN, University of Delaware — Recollision for a laser driven atomic system is investigated in the non-relativistic to relativistic regime via a strong field quantum description and Monte Carlo semi-classical approach. We find the relativistic recollision energy cutoff is independent of the ponderomotive potential  $U_p$ , in contrast to the well-known  $3.2 U_p$  scaling. The relativistic recollision energy cutoff is determined by the ionization potential of the atomic system and achievable with non-negligible recollision flux before entering a “rescattering free” interaction. The ultimate energy cutoff is limited by the available intensities of short wavelength lasers and cannot exceed a few thousand Hartree. This end to rescattering physics, which begins at 1,000 Hartree (27,000 eV,) sets the energy boundary for HHG and recollision based attosecond physics.

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Barry Walker  
University of Delaware

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