

Abstract Submitted
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Photon momentum sharing in strong field photoionization¹ ANDRE D. BANDRAUK, Universite de Sherbrooke — In a recent experiment [1] it has been shown that there is unequal photon momentum sharing between absorbed photons and electrons at high intensities. The experimental results can be interpreted as the breakdown of the dipole approximation at intensities $\sim 10^{14}\text{W}/\text{cm}^2$ and IR wavelengths much larger than atomic sizes $2a_0=0.106\text{ nm}$ [2]. We show analytically and through nonperturbative quantum simulations that very different partitioning of photon momentum occurs in one-photon ionization as compared to multiphoton processes. This suggests there is a rich unexplored electron-ion dynamics and physics generated with current ultrafast intense lasers.

[1] CTL Smeenk et al, Phys Rev Lett 106, 193002(2011)

[2] S Chelkowski, AD Bandrauk, PB Corkum, Phys Rev Lett 113,263005(2014).

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