

Abstract Submitted  
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**Multielectron effects in strong field ionization of molecules**<sup>1</sup> AGNIESZKA JARON-BECKER, YUQING XIA, JILA and Department of Physics, University of Colorado, Boulder — Multielectron effects are studied for strong field ionization of di- and polyatomic molecules at their equilibrium geometries, using time dependent density functional theory. Strong field ionization of molecules have been previously often analyzed using “single active electron” (SAE) approximation based theories such as for example Intense Field Many Body *S*-matrix Theory and typically the contributions from inner valence orbitals and multielectron effects were concluded to be of less importance. For several di- and polyatomic molecules we show that ionization rate from inner valence orbitals can increase dramatically due to a novel resonant coupling which influences the molecular dynamics. We discuss the dependence of the results on the orientation of the molecules and laser parameters. Moreover we show how such a mechanism can lead to localization of electron depending on the symmetry of the orbitals involved. Finally, we propose how the novel mechanism can be observed experimentally and show how the multi-electron effects can help explain several experimental results which have shown disagreement with SAE approximation based theories.

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