

Abstract Submitted  
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**Recollisions and correlated double ionization with circularly polarized light** FRANCOIS MAUGER, Aix-Marseille University, CRISTEL CHANDRE, CNRS, TURGAY UZER, Georgia Institute of Technology — One of the most striking surprises of recent years in intense laser-matter interactions has come from multiple ionization by intense short laser pulses: nonsequential double ionization rates were found to be several orders of magnitude higher than the sequential mechanism allows. This discrepancy has made the characteristic “knee” shape in the double ionization yields versus intensity plot one of the most dramatic manifestations of electron-electron correlation in nature. The mechanism that regulates such correlated ionizations is now settled, for linear polarization, and follows the so-called recollision or three step model. This model which works so well for linear polarization is much harder to justify in elliptic or circularly polarized fields, where the ionized electron is expected to spiral out from the core. As a result, a common wisdom in the strong field community is that recollision is suppressed in circularly polarized fields. The matter would rest there if there were not for contradictory experiments. I will show how the recollision model has to be adapted for circular polarization and explain the two apparently contradictory experiments, the absence of recollision for helium and its presence for magnesium [1].

[1] Phys. Rev. Lett. - **105**, 083002 (2010).

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