Abstract Submitted
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Routes to formation of highly excited neutral atoms in the break-up of strongly driven hydrogen molecule AGAPI EMMANOUILIDOU, University College London — We present a theoretical quasiclassical treatment of the formation, during Coulomb explosion, of highly excited neutral H atoms for strongly-driven hydrogen molecule. This process, where after the laser field is turned off, one electron escapes to the continuum while the other occupies a Rydberg state, was recently reported in an experimental study in Phys. Rev. Lett 102, 113002 (2009). We find that two-electron effects are important in order to correctly account for all pathways leading to highly excited neutral hydrogen formation [1]. We identify two pathways where the electron that escapes to the continuum does so either very quickly or after remaining bound for a few periods of the laser field. These two pathways of highly excited neutral H formation have distinct traces in the probability distribution of the escaping electron momentum components.

[1] A. Emmanouilidou, C. Lazarou, A. Staudte and U. Eichmann, Phys. Rev. A (Rapid) 85 011402 (2012).

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