Abstract Submitted
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Modeling frustrated tunnel ionization experiments[1] P.T. JOHNSON, B.A. DEHARAK, Illinois Wesleyan University, USA, R.D. GLOVER, D. CHETTY, A.J. PALMER, I.V. LITVINYUK, R.T. SANG, Centre for Quantum Dynamics, Griffith University, Australia — The fact that an electron can tunnel out of the potential well of its parent atom or molecule in the presence of a strong laser field is the basis of a number of strong-field phenomena such as above threshold ionization, and nonsequential multiple ionization. In both of those cases the parent is left in an ionized state. However, there is a chance that after the electron has tunneled it will return to a bound state – a process known as frustrated tunnel ionization (FTI) [Nubbemeyer, T., et al. Phys. Rev. Lett. 101(23): 233001 (2008)]. Here we present calculations of FTI yield for argon under various experimental conditions using the rescattering model [P.B. Corkum, Phys. Rev. Lett. 71, 1994 (1993)] with the addition of a coulomb potential term when dealing with the "free" electron. We will contrast the use of different coulomb potential terms and compare these calculations to some of our recently obtained experimental results in both the few-cycle and multi-cycle regime.

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