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Empirical formula for the static field ionization rates of atoms and molecules by lasers from the tunneling to the barrier-suppression regime X.M. TONG, C.D. LIN, Phys. Dept. Kansas State University — We propose an empirical formula for the static field ionization rates of atoms and molecules by extending the well-known analytical tunneling ionization rates to the barrier-suppression regime. The proposed empirical formula can provide accurate ionization rates for atoms and molecules in the intense laser field under the single active electron approximation. The theory can be used to study highly nonlinear phenomena such as high harmonic generation, above threshold ionization and the dissociation dynamics of molecules by intense lasers beyond the usual tunneling ionization regime. The empirical formula retains the simplicity of the original tunneling ionization rate expression but can be used to calculate ionization rates of atoms and molecules by lasers at high intensities. This work was supported in part by the US DOE.

Xiao-Min Tong
Phys. Dept. Kansas State University

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