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Enhancement of high-order harmonic generation from endohedrally confined atoms TURKER TOPCU, Virginia Tech, ERDI A. BLEDA, ZIKRI ALTUN, Marmara University — We describe a scheme in which by coupling exited atoms to fullerenes, one can demonstrably increase the harmonic conversion efficiency in HHG, adding to the toolbox of techniques used to increase photon intensities across the harmonic plateau. We demonstrate this using an endohedrally confined hydrogen atom inside a C_{60} cage, and consider three distinct physical situations in which the initial state is (1) entirely confined inside the C_{60}, (2) partially outside, and (3) mainly localized on the cage wall. We show that when the endofullerene system starts in a state with a classical turning point outside the C_{60} shell, the high-harmonic photon yield can be enhanced up to 4 orders of magnitude. We will explain the underlying physical mechanisms in each case using fully three-dimensional quantum simulations. We assess what fraction of the initial endofullerenes needs to survive the laser pulse in a macroscopic sample for a meaningful increase in the photon yield by propagating the generated harmonics through the mixed medium consisting of atoms and endofullerenes.

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