

Abstract Submitted  
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**Controlling HHG spectra from Laguerre-Gaussian laser modes by spatial medium distribution**<sup>1</sup> DMITRY A. TELNOV, St. Petersburg State University, Russia, SHIH-I CHU, University of Kansas — We study high-order-harmonic generation (HHG) when the incident laser beam is in the Laguerre-Gaussian (LG) mode with a nonzero topological charge. Normally the harmonics are generated also in the LG mode with a nonzero topological charge, and their intensity vanishes on the beam axis. We find that the HHG signal in the central spot of the beam axis still can be detected if the spatial distribution of the medium in the focal region of the incident laser beam is inhomogeneous. Examples are discrete groups of atoms distributed symmetrically or non-symmetrically on the circle with the highest laser intensity or the case when only a part of the circle is uniformly filled with the atoms. Manipulating the medium distribution, it is possible to control the shape of the HHG spectrum, switching on and off harmonics with particular orders or changing their intensity. General theoretical results are illustrated by calculations of HHG in the medium of argon atoms, with the single-atom response obtained by means of the time-dependent density functional theory.

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