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Fullerenes in intense laser fields ANDREAS BECKER, AGNIESZKA JARON-BECKER, Department of Physics and JILA, University of Colorado, Boulder, CO 80309-0440, FARHAD FAISAL, Department of Physics, Bielefeld University, Germany, MARCELO CIAPPINA, Institute of High Performance Computing, Singapore — We have investigated the response of icosahedral fullerenes to an intense laser pulse using the strong-field S -matrix theory. First, we have studied the ionization of C_{60} and other fullerenes up to high charge states and found that the theoretical results are in excellent agreement with experimental observations. The related phenomenon of suppressed ionization of the complex molecules is found to be due to the finite cage size and a multislit interference effect between partial waves emitted from different nuclei. Next, a comparison of the S -matrix predictions with recent experimental observations of ionization of C_{60} in elliptically polarized fields will be presented. Finally, we have shown that the multislit interference effects leave their footprints on the high-order harmonic spectra generated in the fullerenes. Characteristic modulations are found in the plateau region of the spectra at mid-infrared wavelengths but not at near-infrared wavelengths. Using a simple spherical model the radius of the fullerene can be retrieved from the positions of the interference minima.

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