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Few-cycle radially polarized pulses generation CHUNMEI ZHANG, FANQI KONG, Joint Attosecond Science Lab, University of Ottawa and National Research Council of Canada, Ottawa, ON, Canada, HUGO LAROCQUE, EBRAHIM KARIMI, Department of Physics, University of Ottawa, Ottawa, ON. Canada, PAUL CORKUM, Joint Attosecond Science Lab, University of Ottawa and National Research Council of Canada, Ottawa, ON, Canada — Vector beams have broad applications and extending them to the few-cycle regime will influence many fields. We experimentally demonstrated the compression of a radially polarized vector beam in the same way that we compress Gaussian beams using a gas filled hollow-core fiber. The pulses maintain their radially polarized nature. It is feasible, using only well-developed methods, to reach focused intensities of ~10^{19} W/cm^2 where the field strength in all three dimensions reach relativistic intensities. Using solid or gas as a nonlinear medium, it will be possible to produce radially polarized harmonics with a curved wavefront that will reach wavelength scale focal spots compared to Gaussian beams, thus opening a route towards VUV microscopy.

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