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**Quantitative Measurement of Phase Matching Conditions in Higher Order Harmonic Generation** SUDIPTA MONDAL, FREDERIC CONDIN, PHILIPP KLAUS, CARLOS TRALLERO, Kansas State University, BENJAMIN WILSON, KRISTEN GOULD, ERWIN POLIAKOFF, Louisiana State University — HHG has proven to be a very sensitive probe for the electronic structure of atoms and molecules. Since the generation of the harmonics is a macroscopic process, it depends on phase matching conditions. Macroscopic features of phase matching in high harmonics generation are poorly understood and also very difficult to maintain. In this paper we study phase matching in high harmonic generation quantitatively, so that harmonics can be used as an atomic and molecular probe. We measured HHG spectrum with varying laser intensity and focusing conditions. We also change the phase of the input beam by clipping it with an iris, changing it Gaussian to Bessel beam, and observe two regions of phase matching for Gaussian beam becomes one in case of Bessel beams.

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