

Abstract Submitted  
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**Millimeter-Wave, Spiral Phase Plates for Vortex Wave Generation**<sup>1</sup> BLAKE AMACHER, NITIN PARSA, MICHAEL GASPER, RYAN TOONEN, University of Akron — We have designed quasi-optical, spiral phase plates for the purpose of generating millimeter-wave Laguerre-Gaussian beams, which carry non-zero orbital angular momentum. Such beams will be used for experiments involving the interaction of electromagnetic waves, having frequencies ranging from 57 to 67 GHz, with solid state devices and materials. Two phase plates were fabricated from high density polyethylene. One was designed to yield the lowest mode of right-handed chirality (having an azimuthal modal index of +1), and the other was designed to yield the lowest mode of left-handed chirality (having an azimuthal modal index of -1). A customized programmable XYZ-stage was constructed with a sensor head that can simultaneously measure vertical and horizontal polarization components. A finite element analysis tool, ANSYS HFSS, was used to predict beam intensity patterns for comparison to measured results.

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