

Abstract Submitted  
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**Photon Orbital Angular Momentum Spectroscopy<sup>1</sup>** JENNIFER LUMBRES, California State University Los Angeles, DAVID VAN BUREN, La Canada Flintridge, CA — In addition to the photon spin responsible for the two polarization states, photons possess an orbital angular momentum (OAM) with values that are signed integer multiples of  $\hbar$ . We present a table-top spectroscopy experiment to generate, manipulate, and measure OAM states of photons from a laser. We create multiple beams with different OAM content using computer generated fork holograms implemented in 35mm film slides. After overlapping the beams into one combined beam, we use multipoint interferometer apertures to generate interference patterns on an imaging detector. Since the different OAM states are orthogonal these patterns sum. A decomposition of the summed pattern is performed using a simple algorithm which retrieves the intensities of each of the original OAM beams. We show several examples of OAM content retrieval via our method. This research seeks to perform OAM spectroscopy of natural light sources such as direct and scattered sunlight.

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