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Creation and diagnostics of stable rainbow optical vortices

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Abstract

An on-axis computer-synthesized hologram-based technique is introduced to create white-light "rainbow" optical vortices, which are stable with respect to environmental disturbances under long-distance propagation of singularity supporting beams. Regularities governing the radial alternation of colors at highly directed rainbow vortices are discussed. The original diffraction technique for detecting phase singularities is applied to reveal and diagnose the polychromatic vortices.