

Abstract Submitted
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Topological charge algebra of optical vortices in nonlinear interactions ALEXANDRA ZHDANOVA, Texas A&M University, MARIIA SHUTOVA, Texas AM University, AYSAN BAHARI, None, MIAOCHAN ZHI, NIST, ALEXEI SOKOLOV, Texas A&M University — We investigate the transfer of orbital angular momentum among multiple beams involved in a coherent Raman interaction. We use a liquid crystal light modulator to shape the pump beam into an optical vortex with various integer values of topological charge. We then cross the pump beam with an unshaped Stokes beam in a Raman-active crystal to produce multiple Stokes and anti-Stokes sidebands. By using a tilted-lens technique and measuring the resultant vortex charges, we verify that the generated beams topological charges obey a simple equation. This equation can be derived from angular momentum conservation for created and annihilated photons, or alternatively, from phase-matching considerations for the multiple interacting beams.

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