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Optical vortex efficiency of envelope varying gratings using high-phase modulation spatial light modulators. EDWARD SANCHEZ, SACHIN SHARMA, IOANNIS CHATZAKIS, Texas Tech University — Spatial light modulators used for diffraction and to induce angular momentum in laser beams has been studied extensively by various teams. Missing in the literature is a systematic analysis of how varying the envelope of the grating can affect the diffraction efficiency of SLMs, both for grating diffraction and for optical vortex generation. The work of Bowman shed light on how one can analyze the potential distortion of an SLM by viewing its phase unwrapping scheme, doing ones best to ensure this line is as linear as possible. Analysis of efficiency through phase unwrapped lines for each hologram has been applied to different grating envelopes. In specific, we have analyzed sinusoidal, sawtooth, triangle, and square envelopes and compared with experimental results. The results show that the sawtooth grating achieves the highest efficiency at a specific diffraction order.

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