

Abstract Submitted
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Optical Filtering with Phase Singularities WILLIAM AMES, IRINA NOVIKOVA, College of William and Mary — It is a common situation in nonlinear optics for strong and weak light fields to propagate nearly collinearly inside an interaction region, but for detection the strong field must be completely removed without attenuating the weak field. To solve this problem we have adopted the idea of the optical vortex coronagraph [G. Foo et al., Opt. Lett. 30, 3308 (2005)]. This optical filtering device converts the strong field into a “doughnut” intensity profile by introducing an optical vortex using a step phase mask, and then filters it out by blocking everything but the dark central part. The weak field, on the other hand, propagating at small angle, is not affected by the mask and can be detected. We demonstrate the effectiveness of the technique, discuss its limitations, and propose improvements to the design.

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