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Intensity Distribution along a Partially Obstructed Axicon Focal Line HARRY CORIN, LINUS FEDER, BO MIAO, JARON SCHROCK, HOWARD MILCHBERG, University of Maryland, College Park — Bessel beams, typically produced using axicons, are used in the generation of plasma waveguides and for laser machining, but these applications can involve obstructions, such as gas nozzles, that block part of the beam. This distorts the beam and reduces the peak intensity along the focal line (along z). We investigated, with experiment and propagation simulation, the intensity distribution of an obstructed Bessel beam. In the experiments, a 2.5cm diameter laser beam was focused by a transmissive axicon and blocked by obstructions of varying cross sectional profiles and lengths. The propagation path-dependent intensity profile was constructed by imaging it all along z. The images were then compared to a 3-D beam propagation simulation of the same system. Plasma waveguides up to 10 cm in length were then generated in the same geometry and the z-dependent peak electron density was compared to the z-dependent intensity profile.

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