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**Characterization of carrier drift and diffusion in an InSb focal plane array under high-intensity excitation** BRYANT WYSOCKI, MICHAEL MARCINIAK, Air Force Institute of Technology, MITCHELL HAERI, Raytheon Co. — A study of blooming effects in a 640 x 480 indium-antimonide (InSb) focal plane array (FPA) with 20-$\mu$m pixel-to-pixel spacing and operated at 77 K is presented. Electronic and optical blooming from both a high-intensity blackbody spectral source and a 4.6 $\mu$m narrow line-width laser source is examined. A 30-$\mu$m pinhole/mask was fastened directly to the FPA to achieve spatial isolation of individual pixels in an attempt to separate optical and electronic effects. A series of experiments both with and without the mask present was run to determine the relative contributions of each. Images were captured and analyzed. Optical effects caused by ghosting, diffraction, and lens and housing scatter were shown to dominate, resulting in global loss of image quality. It was determined that global saturation is primarily caused by scattering generated in the optics of the imaging system and the dewar window. Effects due to electronic phenomenon, such as carrier diffusion and charge bleeding, were shown to be minimal and locally constrained to $\sim$20 $\mu$m. A simple model of carrier drift and diffusion was constructed to provide a theoretical model of the crosstalk between pixels.

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