Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Bridging the Gap Towards the Monolithically Integrated Selective Polarizer: A Dynamic Metamaterial Polarization Grid COREY SHEMELYA, NICOLE PFIESTER, Tufts University, GANESH BALAKRISHNAN, University of New Mexico, THOMAS VANDERVELDE, Tufts University — The use of active metamaterials in devices has gained much attention recently based on their scalabilty, tunability, and the ability to turn them on or off. This work describes the use of metamaterial patterning to create a dynamic polarizer for monolithic integration on photodetectors. The design was tuned for wavelengths in the mid-infrared transmission window for the use of sensing man-made objects. Samples were fabricated using Si doped GaAs epitaxially grown on a c-plane sapphire substrate. Gold metamaterials were patterned and deposited along with ohmic and schottky contacts using physical vapor deposition. The results are compared to similar metamaterials on various substrate materials: double-sided polished (DSP) intrinsic GaAs, DSP n-type GaAs, N+ GaSb, and p-type Si.

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Date submitted: 09 Nov 2012 Electronic form version 1.4