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Plasmon Based Grating Gate Terahertz Detector E.A. SHANER, MARK LEE, M.C. WANKE, ALBERT GRINE, J.L. RENO, Sandia National Labs — Double quantum well grating gate detectors have recently emerged as a widely tunable detector of millimeter wave to THz radiation. A typical device consists of source and drain contacts along with a grating gate which both modulates the carrier density and couples in the free space radiation to the plasmon modes of the double quantum well heterostructure. In a resonant mode of operation, the grating period determines the frequency range of the detector while the gate bias tunes the operating frequency. When the gate is biased near pinch-off, the detector becomes bolometric and responsivity increases dramatically. This talk outlines current progress towards combining the plasmon resonant frequency selectivity with the responsivity of the bolometric regime through the application of a split grating gate that allows for more flexible biasing of the detector while still coupling free space radiation into the device. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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