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Tunable THz plasmon resonances in a InGaAs/InP heterostructure HIMANSHU SAXENA, ROBERT PEALE, University of Central Florida Orlando 32816, WALTER BUCHWALD, AFRL/RYHC Hanscom AFB MA 01731 — Gate-bias tuned plasmon resonances excited by THz radiation in a two dimensional electron gas are reported. A commercial InGaAs/InP HEMT wafer is patterned with source, drain, and 500 nm period grating gate contacts. The grating couples THz radiation to the plasmons, defines their wavevector, and tunes the sheet charge density with applied bias. Fourier spectroscopy over the range $10 - 200$ cm^{-1} at 4 K reveals absorption at the fundamental plasmon frequency along with several higher harmonics. These resonances shift to lower frequency with sheet-charge depletion as expected from theory and the device electrical properties. The device has potential as a tunable narrow-band detector for spectrometer on a chip and space situational awareness applications.

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