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Voltage Tunable Multicolor GaAs/AlGaAs Coupled Quantum Well Infrared Photodetector JAE KYU CHOI, DAVID EASON, GOTTFRIED STRASSER, NIZAMI VAGIDOV, VLADIMIR MITIN, University at Buffalo, SUNY — Tunable quantum well infrared photodetectors (QWIP) has attracted attention because of the mature growth technique of GaAs/AlGaAs quantum wells and their diverse applications such as remote temperature sensing, chemical analysis, military applications, and so on. We have designed, grown, and characterized a voltage tunable multicolor QWIP for the long wavelength infrared detection (7.5 – 12.4 μm). The QWIP structure was grown by MBE, and the device is designed to have bound to bound and bound to quasi-continuum transitions in an asymmetrically doped double quantum well. At zero bias we observed several distinctive spectral lines in photoresponse. The device demonstrates strong dependence on a magnitude and a polarity of the bias that is confirmed by the shift of energy levels in the electric field calculated by nextnano³ software. In particular, switching bias from +3V to -5V we change the photoresponse of our detector from 8.39 μm to 10.21 μm .

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