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Polarized Mid-Infrared Surface Emission from InAs Quantum Dots D. WASSERMAN, S.A. LYON, C. GMACHL, Princeton University, E.A. SHANER, Sandia National Laboratories — Polarized mid-infrared surface electroluminescence from self-assembled InAs quantum dots has been observed at 77K. A graded AlGaAs injector is used to inject electrons into excited states in the quantum dot layer. A superlattice electron filter prevents direct electron tunneling out of the quantum dot excited states, increasing the probability of optical transitions to lower energy dot states. Two mid-infrared peaks are seen in the electrically pumped surface emission spectra of the device, one at 100meV, the other at 170meV. The emission peaks are orthogonally polarized within the growth plane, indicating photon emission from intersublevel electron transitions within anisotropically shaped quantum dots. This work suggests the feasibility of using quantum dot mid-infrared emission to study both the morphology of, and intersublevel transitions within, self-assembled quantum dots.

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