

Abstract Submitted
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Broadband Midwave Infrared InAs/GaSb Superlattice Light-Emitting Diodes RUSSELL RICKER, SYDNEY PROVENCE, University of Iowa, DENNIS NORTON, None, JOHN PRINEAS, THOMAS BOGGESS, University of Iowa — Broadband (3.0 μm to 5.0 μm) emission is reported from InAs/GaSb superlattice light-emitting diodes grown via molecular beam epitaxy. Stacked active regions, each with a different emission wavelength, were connected with tunnel junctions, resulting in multiple emission wavelengths in a monolithic structure. Eight active regions provided eight overlapping emission spectra, simulating a broadband spectrum. Chips with mesas of sizes ranging from 24 μm x 24 μm to 400 μm x 400 μm were fabricated and wire bonded to a leadless chip carrier (LCC). The LCC was mounted in a liquid nitrogen cryostat. At low input currents, distinct peaks were observed at 3.3 μm , 3.6 μm , 3.9 μm , 4.2 μm , 4.5 μm , 4.9 μm , and 5.3 μm . At high input currents a continuous spectrum was observed with a peak near 3.8 μm and with a full-width at half-maximum of 1.42 μm . In quasi-continuous operation at 77 K, radiances exceeding 0.35 W/cm²-sr in a Lambertian profile were achieved. Current dependent electroluminescent spectra measured at liquid nitrogen temperatures demonstrate the blending of the various colors from each stage into one smooth spectrum at high currents.

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