

## High-performance growth of terahertz quantum cascade laser structures by solid source MBE

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High performance growth of terahertz quantum cascade lasers (THz QCLs) based on hybrid bound-to-continuum transition and resonant phonon extraction is presented by solid source molecular beam epitaxy. The corresponding accurate control of layer thickness and alloy composition during growth, with precise calibration of the growth rate of Ga and Al by reflection high energy electron diffractometry and high resolution XRD techniques are studied in detail. By utilizing surface plasmon ridge waveguide device structures, the THz QCLs lasing at 3.3 THz with maximum powers of 426 mW at 10 K and 213 mW at 80 K are realized in pulsed mode and the maximum lasing temperature achieves 110 K.

**Keywords:** terahertz, quantum cascade laser, molecular beam epitaxy, superlattice, herterostructure.

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