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Quantum cascade lasers as LO for THz mixers RAHUL RAMASWAMY, Uni at Buffalo , ANDREY MURAVIEV, KAI WANG, CHRISTOPH DEUTSCH, JAEKYU CHOI, DAVID EASON, GOTTFRIED STRASSER, MICHAEL SHUR, ANDREI SERGEEV, VLADIMIR MITIN — In this research we fabricate and characterized a number of Fabry-Perot type, multi mode terahertz quantum cascade lasers operating in the range 2 – 3 THz. AlGaAs/GaAs heterostructures for terahertz QCLs have been grown using molecular beam epitaxy (MBE) on a SI-GaAs substrate. The active region design is based on a vertical transition in which a combination of resonant tunneling and LO-phonon scattering is used to selectively depopulate the lower radiative state. Double-sided metal waveguide is employed for QCL mode confinement. Spectral properties of the QCLs have been investigated by means of Fourier transform spectroscopy. All QCLs show the gain spectral band tunability by varying the applied bias voltage. Single mode laser operation is observed in a certain range of applied bias voltages. Our QCLs have an inherently narrow line-width, which is limited in our measurements by the spectrometer resolution of 0.1cm^{-1} .

Rahul Ramaswamy
Uni at Buffalo

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