

Abstract Submitted
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High precision frequency characterization of THz quantum cascade lasers by heterodyne mixing MARK LEE, MICHAEL WANKE, MAYTEE LERTTAMRAB, ERIK YOUNG, ALBERT GRINE, JOHN RENO, Sandia National Laboratories, ROBERT DENGLER, PETER SIEGEL, Jet Propulsion Laboratory - Cal Tech — Terahertz quantum cascade lasers (QCLs) have been used together with a monolithic planar Schottky diode receiver to study the heterodyne mixing between dual internal modes of a QCL and between a single mode of a QCL and a known molecular line from a molecular gas laser. Dual mode mixing using a single QCL shows that the intrinsic linewidth of a free-running QCL is < 30 kHz. Both standard and distributed feedback grating QCLs were mixed against known molecular gas laser lines. Resulting difference frequency spectra gave a high precision measurement of a QCL's absolute frequency against known references. Unusual slow transient turn-on behavior was also observed in a pulsed standard QCL. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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