231. Title: MEMS-plunger Platform for Tunable Terahertz wire Laser at ~5 K

Author: Qin Q; Hu Q

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Abstract: The tuning of a terahertz quantum cascade wire laser, operated at ~5 K, is demonstrated using a micro-machined metal or silicon object, called a `plunger', attached to a MEMS-based two-stage flexure and actuated by a differential micrometer through a piezo-actuator that is de-amplified by a lever system. The heterogeneous system including the plunger, made from a silicon-on-insulator wafer, and a wire laser based on GaAs/AlGaAs material with first-order distributed feedback corrugation, works at liquid helium temperature (~5 K). The double-stage flexure design enables a frictionless, reversible and continuous tuning over a broad range of ~330 GHz (~8.6% of the 3.85 THz center frequency) with single-mode operation.