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Title:Terahertz imaging through self-mixing in a quantum cascade laser

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Abstract:We demonstrate terahertz (THz) frequency imaging using a single quantum cascade laser (QCL) device for both generation and sensing of THz radiation. Detection is achieved by utilizing the effect of self-mixing in the THz QCL, and, specifically, by monitoring perturbations to the voltage across the QCL, induced by light reflected from an external object back into the laser cavity. Self-mixing imaging offers high sensitivity, a potentially fast response, and a simple, compact optical design, and we show that it can be used to obtain high-resolution reflection images of exemplar structures.

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