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Title:Demonstration of a self-mixing displacement sensor based on terahertz quantum cascade lasers
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Abstract:There has been growing interest in the use of terahertz (THz) quantum cascade lasers (QCLs) for sensing applications. However, the lack of compact and sensitive THz detectors has limited the potential for commercial exploitation of sensors based on these devices. We have developed a self-mixing sensing technique in which THz QCLs are used for both generation and interferometric sensing of THz radiation, eliminating the need for a separate detector. Using this technique, we have measured the displacement of a remote target, both with and without opaque (in the visible spectrum) materials in the beam path and demonstrated a stand-off distance of up to 7 m in air.
Number of references:13