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Title:Terahertz imaging achieved with low-cost CMOS detectors
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Abstract:Subwavelength antennas in the metal interconnection layer of an inexpensive CMOS chip couple terahertz radiation to the chip's electronics, enabling the creation of inexpensive, compact imagers. An antenna structure is needed to effectively couple the free-space terahertz wave to the subwavelength transistor. The whole structure can be realized with a standard complementary metal-oxide-semiconductor (CMOS) process, including the metal antenna, which is implemented in the metal interconnection layers. This ability to be processed with a standard industrial silicon technology is one of the main benefits of this approach. The sensitivity of the terahertz CMOS pixel determines the maximum image frequency and/or the minimum light of the terahertz source still detectable. It can be expressed using various terms, such as the noise-equivalent power (NEP) or the power sensitivity. The NEP represents the minimum detectable power for a given detection/noise bandwidth, and is defined by the incident radiation power leading to a signal-to-noise ratio (SNR) of 1 at the output of the detector.
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