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标题: A Fast Terahertz Spectrometer Based on Frequency Selective Surface Filters
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摘要: We present a fast spectrometer working in the 0.7-4.8 THz range. Broadband radiation from a blackbody source is focused first on a rotating silicon wafer, whose surface was patterned with 18 metal band-pass filters, then on the sample under test and finally is detected by a superconducting microbolometer with microsecond time constant. The bolometer sensor is coupled to a spiral antenna whose frequency band matches the spectral range of the filters. The spectral resolution is set by the filters quality factor of about 3. A dynamic range of 100 and a S/N ratio of 20 are achieved by integrating for less than 10 second. The detector can operate up to 6 K in a closed-cycle cooler, hence making the present apparatus suitable for building up a simple terahertz video-rate spectrometer.
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