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Title:Nanobolometers for THz photon detection

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Abstract: This paper reviews the state of rapidly emerging terahertz hot-electron nanobolometers (nano-HEB), which are currently among of the most sensitive radiation power detectors at submillimeter wavelengths. With the achieved noise equivalent power close to 10^{-19} W/Hz^{1/2} and potentially capable of approaching NEP $\sim 10^{-20}$ W/Hz^{1/2}, nano-HEBs are very important for future space astrophysics platforms with ultralow submillimeter radiation background. The ability of these sensors to detect single low-energy photons with high dynamic range opens interesting possibilities for quantum calorimetry in the midinfrared and even in the far-infrared parts of the electromagnetic spectrum. We discuss the competition in the field of ultrasensitive detectors, the physics and technology of nano-HEBs, recent experimental results, and perspectives for future development.

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