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Uncooled matrix terahertz microbolometric detectors

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The paper continues the discussion of issues related to the development of detectors of radiation in the terahertz range. Methods for increasing the absorption coefficient of terahertz radiation, which are used in the development and creation of matrix uncooled microbolometric receivers of THz radiation, are considered. Almost complete absorption of THz radiation is achieved using: 1) antennas loaded with a resistive load, 2) thin metal absorbers, 3) metamaterials or frequency-selective surfaces, 4) gold black and 5) carbon materials, primarily vertically oriented carbon nanotubes. In the case of antennas and thin metal absorbers, a thick dielectric layer additionally increases the effective thickness of the gap between the reflector and the bolometer membrane, and additional resonators are used, formed by the gap between the bolometer and the entrance window. To increase the sensitivity bandwidth, inverted bolometers with absorbers based on thin metal absorbers are used.

Keywords: terahertz radiation, detection, uncooled array bolometric detectors.

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