

标题: Electromagnetic Wave Detection Via Interaction With Non-Uniform Distributed Space Charge In Vacuum

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摘要: The detection of electromagnetic radiation of subterahertz (up to 0.14 THz) and IR regions obtained from the interaction with non-uniformly distributed space charge in the interelectrode space of a vacuum triode with plane electrodes is experimentally demonstrated. The dependence of the detected signal from the direction of wave polarization and vacuum triode's current characteristics has been investigated.

A simple theoretical model, according to which, the detection is due to nonlinearity associated with the non-uniform distribution of electrons along the electrostatic field direction, has been proposed to explain the mechanism of detection. The measured detection characteristics reasonably agree with theoretical results, based on low-level signal approximation and assuming that the current-voltage characteristic of the used devices (triodes) obeys the law of $3/2$.

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