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**Modeling of resonant terahertz detector with two-dimensional electron gas and lateral Schottky junction** NIZAMI VAGIDOV, University at Buffalo, University of Aizu, Japan, AKIRA SATOU, VICTOR RYZHII, University of Aizu, Japan, MICHAEL SHUR, Rensselaer Polytechnic Institute, VLADIMIR MITIN, University at Buffalo — We developed a device model for a resonant detector of terahertz (THz) radiation based on a heterostructure with an ungated two-dimensional electron channel and with a lateral Schottky junction at one of the channel edges (recently proposed and assessed by us using an analytical model). The resonant operation of the detector is associated with the excitation of electron plasma oscillations in the channel with the channel serving as a resonant cavity for the plasma waves. The rectification of the signals is due to nonlinearity of the lateral Schottky junction current-voltage characteristics. The model comprises a kinetic equation governing the electron transport in the device channel and a two-dimensional Poisson equation for the self-consistent electric potential. A novel approach, accounts for the electron-electron collisions and other scattering mechanisms, is used for numerical solution of the equations of the model. Using the developed model, we studied the resonant excitation of plasma oscillations by incoming terahertz signals and calculated the detector responsivity at different levels of excitation of the plasma oscillations. The THz detector performance is compared with that of Schottky diodes without the plasma resonant cavity.

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