

INTERACTION
OF A TERAHERTZ ELECTROMAGNETIC
WAVE WITH THE PLASMONIC SYSTEM
“GRATING– 2D-GAS”. ANALYSIS
OF FEATURES OF THE NEAR FIELD

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S u m m a r y

The theory of interaction between electromagnetic waves and a plasmonic structure consisting of the subwavelength metal grating locating over the layer of a two-dimensional (2D) electron gas has been developed. The frequency dependences of the transmission, reflection, and loss coefficients are shown to have a resonant behavior relating to the excitation of plasmons in the 2D gas. The influence of the geometrical and electrical parameters of the system on the plasmon resonance characteristics is studied, and the structure of an electromagnetic field in the near-field zone is analyzed. The spatial distributions of the electric field components, the electric power density, and the electromagnetic wave polarization are found. The plasmon resonance is shown to substantially increase the local concentration of the electric field in the near-field zone of the grating.