

240

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Title:Analysis on SPP pulse rectifier producing THz electromotive force

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Abstract:To further study THz electromotive force (EMF) of the surface plasma (SP) in the direction propagation, the external force on electron of (SPP) pulse for rectification on the nanowire structure was introduced, and the traction rectifier role the surface plasmon was analyzed. In addition, theoretical model of SPP transverse mode was discussed in the condition of long pulse and short pulse. Results of the study show that the surface plasmon rectifier will produce a large amplitude electromotive force of 10 V, otherwise, because of the restrictions of nanoplasma, the plasma rectifier is almost the nonresonant amplification, which is characterized by rapid surface plasma rectifier, THz frequency, and bandwidth up to 5-20 THz. In terms of strong limitation of nanoplasma and longitudinal SPP wave localization, SPP rectifier will produce a higher local THz electric field on the metal surface with intensity of 10^{5-6} V/cm. It is significant in detection of femtosecond optical field on nanoscale, nanoplasma polarization couple semiconductor equipment and nonlinear spectroscopy research.

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