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Title:Design of a beam reconfigurable thz antenna with graphene-based switchable high-impedance surface

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Abstract:In this paper, a new beam reconfigurable antenna is proposed for THz application, which is based on a switchable high-impedance surface (HIS) using a single-layer graphene. The effects of impurity density and gate voltage on the conductivity of graphene are utilized, and the switchable reflection characteristic of the graphene-based HIS is observed. Then the THz antenna is designed over this switchable HIS. By applying different voltages for different rows of HIS units, the antenna beam can be reconfigurable. The performance of the antenna is analyzed with its reflection coefficient, radiation pattern, and input impedance. The radiation beam of the antenna can vary in a range of $\pm 30^\circ$ as demonstrated by the simulated results. ©copy; 2012 IEEE.

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