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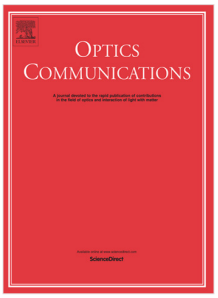

Electrically controllable directional coupler based on tunable hybrid graphene nanoplasmonic waveguide

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Electrically controllable directional coupler based on tunable hybrid graphene nanoplasmonic waveguide

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Abstract： Graphene as a promising material for terahertz-infrared region plays an important role in nanoplasmonic devices owing to its tunability. We propose a hybrid graphene nanoplasmonic waveguide and analyze its propagation properties by finite element method. The results show that the light in terahertz-infrared region can be confined at low-index material and the fundamental mode can be tuned flexibly by changing Fermi energy level of graphene. Then an application of the designed waveguide, an electrically controllable directional coupler is designed and its performance is numerically verified. This approach can be extended to novel designs of nanoscale integrated photonic devices.

Keywords: Surface plasmons; Graphene; plasmonic waveguide; Directional coupler

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