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Title

Unique prospects for graphene-based terahertz modulators

Source

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Abstract

The modulation depth of two-dimensional electron-gas (2DEG) based terahertz (THz) modulators using AlGaAs/GaAs hetero-structures with metal gates is inherently limited to <30%. The metal gate not only attenuates the THz signal but also severely degrades modulation depth. Metal losses can be significantly reduced employing an alternative material with tunable conductivity. Graphene presents a unique solution to this problem due to its symmetric band structure and extraordinarily high hole mobility. In this work, we show that it is possible to achieve a modulation depth of >90% while simultaneously minimizing signal attenuation to <5% by tuning the Fermi level at its Dirac point. (18 References).