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Title:Analysis of surface plasmon excitation at terahertz frequencies with highly doped graphene sheets via attenuated total reflection
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Abstract:Excitation of surface plasmons supported by doped graphene sheets at terahertz frequencies is investigated numerically. To alleviate the momentum mismatch between the highly confined plasmon modes and the incident radiation, it is proposed to increase the surface conductivity of graphene through high doping levels or with few-layer graphene. For currently achievable doping levels, our analysis shows that surface plasmons on monolayer graphene may be excited at operating frequencies up to about 10 THz (~41.3 meV) with a high-index coupling prism, and higher frequencies/energies are possible for few-layer graphene. These highly confined surface modes are promising for sensing and waveguiding applications in the terahertz regime.
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Inspec controlled terms:attenuated total reflection - doping - graphene - surface conductivity - surface plasmons - terahertz wave spectra - terahertz waves
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