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Title:Tailoring Terahertz Near-Field Enhancement via Two-Dimensional Plasmons
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Abstract:We suggest a novel possibility for electrically tunable terahertz near-field enhancement in flatland electronic materials supporting two-dimensional plasmons, including recently discovered graphene. We employ electric-field effect modulation of electron density in such materials and induce a periodic plasmonic lattice with a defect cavity. We demonstrate that the plasmons resonantly excited in such a periodic plasmonic lattice by an incident terahertz radiation can strongly pump the cavity plasmon modes leading to a deep subwavelength concentration of terahertz energy, beyond λ/1000, with giant electric-field enhancement factors up to 104, which is 2 orders of magnitude higher than achieved previously in metal-based terahertz field concentrators.
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Inspec controlled terms:electric field effects - electron density - graphene - plasmonics - plasmons - terahertz wave spectra - voids (solid)
Uncontrolled terms:tailoring terahertz near-field enhancement - two-dimensional plasmons - electrically tunable terahertz near-field enhancement - flatland electronic materials - graphene - electric-field effect modulation - electron density - periodic plasmonic lattice - defect cavity - incident terahertz radiation - cavity plasmon modes - deep subwavelength concentration - giant electric-field enhancement factors - C
Inspec classification codes:A7145G Exchange, correlation, dielectric and magnetic functions, plasmons - A6170Q Inclusions and voids - A7320M Collective excitations (surface states) - A7870G Microwave and radiofrequency interactions with condensed matter
Chemical indexing:C/el
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