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Title: Design principles for infrared wide-angle perfect absorber based on plasmonic structure
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Abstract: An approach for designing a wide-angle perfect absorber at infrared frequencies is proposed. The technique is based on a perfectly impedance-matched sheet (PIMS) formed by plasmonic nanostructure. It is shown that the effective impedance is more physical meaningful and beneficial than effective medium in describing the electromagnetic properties of metamaterial absorber. As a specific implementation of this technique, a wide-angle polarization-independent dual-band absorber is numerically demonstrated at frequencies of 100THz and 280THz with absorption close to 100% simultaneously. Circuit models are utilized to describe the impedance property of localized plasmon modes and the results show good agreement with that retrieved from reflection coefficient at normal incidence.