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标题: Investigation of Multilayer Subwavelength Metallic-Dielectric Stratified Structures
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摘要: We investigate dispersion properties of n-layers unit cell metallic-dielectric stratified structures (MDSSs) for the first time to our knowledge. An efficient and flexible numerical method is applied to study optical characteristics of the MDSSs. As an example, we systematically investigate the influences of geometric parameters, operating frequency, and gain material on the dispersion properties of the n-layers unit cell MDSSs in the terahertz regime. The results show that the effective index of the n-layers unit cell MDSSs decreases with the increase of operating frequency. The full-width-half-maximum of the transmittance of the n-layers unit cell MDSSs can be designed wider than that of the binary unit cell MDSSs, which is beneficial for the design of certain optical devices, such as superlenses. Furthermore, the effective index/loss of the proposed structure increases/decreases with the increase of the material gain. Due to the high flexibility of the proposed n-layers unit cell MDSSs, we believe they would have broad applications in the fields of nanophotonics and integrated optoelectronics.
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