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标题: The Extraordinary Transmission Spectrum in Terahertz Regime: Combination of Shape Resonances and Rayleigh anomalies
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摘要: We present the Terahertz wave extraordinary transmission through thin metal film with periodic arrays of subwavelength rectangular holes. By designing metallic hole arrays with different periods along x and y direction, the transmission spectrum with a non-Fano type is obtained. The roles of shape resonances and Rayleigh anomalies in extraordinary transmission are clarified. Our results demonstrate that the enhanced transmission can be attributed to the shape resonance, and the position of transmission minimum comes from the Rayleigh anomaly which is related to the period of the holes array. Shape resonance in hole arrays is different from the classical waveguide resonance, instead, the resonance behaves a surface plasmon polariton-like character but it is irrelevant to the period of the hole arrays. Our finding is applicable to exploit terahertz field localization which can be used to study terahertz nonlinear spectroscopy of materials.
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