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Title:Ultrabroad terahertz bandpass filter based on a multiple-layered metamaterial with flexible substrates

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Abstract:An ultrabroad and sharp transition bandpass flexible terahertz (THz) filter is designed using a multiple-layered metamaterial. This bandpass filter has excellent filtering capability, with a 3 dB bandwidth of about 0.47 THz and sharp band-edge transitions of 80 dB/THz and 96 dB/THz, respectively, and it can be realized by a coupling individual resonance mode. We find that the geometry parameters have an influence on the transmission profile, which are capable of giving us meaningful guidance in design of high profile bandpass THz filters. The numerical results show that the multiple-layered flexible metamaterial provides an effective way to achieve ultrabroad THz devices.

Number of references:20

Inspec controlled terms:band-pass filters - metamaterials - optical filters - optical multilayers - terahertz wave devices

Uncontrolled terms:ultrabroad terahertz bandpass filter - multiple-layered metamaterial - flexible substrates - sharp transition bandpass flexible terahertz - sharp band-edge transitions - individual resonance mode - geometry parameters - transmission profile - frequency 0.47 THz

Inspec classification codes:A4280C Spectral and other filters - A4270 Optical materials - B4190F Optical coatings and filters - B4110 Optical materials

Numerical data indexing: frequency 4.7E+11 Hz

Treatment: Practical (PRA); Experimental (EXP)

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