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Title:Anisotropic change in THz resonance of planar metamaterials by liquid crystal and carbon nanotube
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Abstract:THz metamaterials are employed to examine changes in the meta-resonances when two anisotropic organic materials, liquid crystal and carbon nanotubes, are placed on top of metamaterials. In both anisotropic double split-ring resonators and isotropic four-fold symmetric split-ring resonators, anisotropic interactions between the electric field and organic materials are enhanced in the vicinity of meta-resonances. In liquid crystal, meta-resonance frequency shift is observed with the magneto-optical coupling giving rise to the largest anisotropic shift. In carbon nanotube, meta-resonance absorptions, parallel and perpendicular to nanotube direction, experience different amount of broadening of Lorentzian oscillator of meta-resonance. Investigation reported here opens the application of metamaterials as a sensor for anisotropic materials. © 2012 Optical Society of America.
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