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Title:Terahertz active spatial filtering through optically tunable hyperbolic metamaterials
Authors:Rizza, Carlo (1); Ciattoni, Alessandro (2); Spinozzi, Elisa (3); Columbo, Lorenzo (1)
Author affiliation:(1) Dipartimento di Scienza e Alta Tecnologia, Università dell'Insubria, Via Valleggio 11, 22100 Como, Italy; (2) Consiglio Nazionale delle Ricerche, CNR-SPIN, 67100 Coppito L'Aquila, Italy; (3) University of Rome La Sapienza, Department of Information Engineering Electronics and Telecommunications, Via Eudossiana 18, 00184 Roma, Italy; (4) Consiglio Nazionale delle Ricerche, CNR-IFN, 70126 Bari, Italy
Corresponding author:Ciattoni, A.(alessandro.ciattoni@aquila.infn.it)
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Abstract:We theoretically consider infrared-driven hyperbolic metamaterials able to spatially filter terahertz (THz) radiation. The metamaterial is a slab made of alternating semiconductor and dielectric layers whose homogenized uniaxial response, at THz frequencies, shows principal permittivities of different signs. The gap provided by metamaterial hyperbolic dispersion allows the slab to stop spatial frequencies within a bandwidth tunable by changing the infrared radiation intensity. We numerically prove the device functionality by resorting to full wave simulation coupled to the dynamics of charge carries photoexcited by infrared radiation in semiconductor layers. © 2012 Optical Society of America.
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