

Abstract Submitted  
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**THz spectroscopy and ellipsometry of magnetic metamaterials**

WILLIE PADILLA, Los Alamos National Laboratory, MS K764 MST-10, Los Alamos, NM 87545, TA JEN YEN, NICHOLAS FANG, Department of Mechanical and Aerospace Engineering, University of California at Los Angeles, 420 Westwood Plaza, Los Angeles, CA 90095, DAVID VIER, Department of Physics, University of California San Diego, La Jolla, California 92093-0319, DAVID R. SMITH, Department of Electrical & Computer Engineering, Durham, NC 27708-0291, JOHN PENDRY, Condensed Matter Theory Group, Blackett Laboratory, Imperial College, London SW7 2AZ, UK, XIANG ZHANG, Department of Mechanical and Aerospace Engineering, University of California at Los Angeles, 420 Westwood Plaza, Los Angeles, CA 90095, DIMITRI BASOV, Department of Physics, University of California San Diego, La Jolla, California 92093-0319 — We present S and P polarized measurements of artificial bianisotropic magnetic metamaterials, (metallic split rings), with resonant behavior at infrared frequencies. Simulation of the reflectance yields excellent agreement with the experimental data. It is shown that although the artificial magnetic materials do indeed exhibit a magnetic response, care must be taken to avoid an undesirable electric dipole resonance, due to lack of reflection symmetry in one orientation. The effects of bianisotropy on negative index are detailed and shown to be beneficial for certain configurations of the material parameters.

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