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Bianisotropy Compensation in Metamaterials GEORGE KEISER, ANDREW STRIKWERDA, Department of Physics-Boston University, KEBIN FAN, XIN ZHANG, Department of Mechanical Engineering- Boston University, RICHARD AVERITT, Department of Physics- Boston University — The potential scientific and technological applications for metamaterials abound and continue to multiply at an unprecedented rate. However, with applications come non-trivial design challenges. For instance, many metamaterial designs exhibit the phenomenon of bianisotropy, the ability for an incident electric field to excite a magnetic response (and vice versa) in the metamaterial. In many applications, this bianisotropic response is considered a parasitic effect to be avoided whenever possible. Metamaterials can be designed to eliminate bianisotropy at the unit cell level, but the presence of a substrate will inevitably reintroduce bianisotropy into the system. Here, through a judicious choice of unit cell geometry, we have compensated for and removed the effects of substrate-induced bianisotropy in broadside coupled split-ring resonators on a GaAs substrate. We present numerical simulation results, parameter extraction, and experimental measurements at terahertz frequencies to validate this claim.

George Keiser
Boston University

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