Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Coupling of metamaterial resonance with properties of multiferroic $TbMn_2O_5$[1] DANIEL M. HELIGMAN, A. M. POTTS, M. T. WARREN, R. VALDÉS AGUILAR, Center for Emergent Materials, Department of Physics. The Ohio State University. Columbus, OH 43210, S-W CHEONG, Department of Physics and Astronomy, Rutgers University. Piscataway, NJ 08456 — Metamaterials have been extensively studied with a focus on negative index of refraction, resonant absorption, optical phase control, and optical activity among other properties. Although the fundamental properties of metamaterials are interesting, the interaction between them and the properties of exotic substrates has not been researched. We analyze the effect of using a multiferroic material as a substrate on the resonant properties of a metamaterial whose unit structure is a gammadion cross. We use multiferroic material $TbMn_2O_5$ as a substrate. This multiferroic has an electromagnon resonance around 300 GHz, close to where the gammadion metamaterial also has a resonant absorption. We find evidence of interaction between these modes in the frequency shift of the electromagnon resonance by a few tens of GHz. We will present these results together with a complete study of gammadion cross metamaterials, experiment and simulation, as a function of their size and the periodicity of the structure grown on Si substrates.

[1]This work partially supported by the Department of Physics and by the Institute for Materials Research under Facility grant IMR-FG0168

Daniel Heligman
Ohio State Univ - Columbus

Date submitted: 08 Nov 2016 Electronic form version 1.4