Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Polarization Rotation by Multilayered Chiral Metamaterial[1] YUMIN ZHANG, Southeast Missouri State University, NATHAN BURFORD COLLABORATION — Traditionally, negative permittivity was realized by plasma resonance of the metallic structures, and negative permeability was achieved by a resonant LC circuit. Chiral metamaterial is another route to achieve negative permittivity and permeability, and such structures were investigated at different frequency domains. Recently, it was demonstrated that a two-dimensional lattice of three-dimensional gold spirals can effectively block circular polarized light with the same handedness for a frequency range exceeding one octave. From the point of view of applications, metamaterials must be fabricated easily and cheaply, and one way to achieve this goal is planarization. We designed a multiple-layer quasi-helix PCB structure and had it fabricated. The sample was tested with automated free space microwave material measurement system at X-band. These layers of PCB can be arranged in two different configurations: left-handed or right- handed helix. We found that the polarization plane is rotated in the opposite direction for the left- and right-handed samples, and the measured S-parameters agree with the simulation result relatively well.

[1]The authors would like to acknowledge the support from GRFC grant from Southeast Missouri State University.

Yumin Zhang
Southeast Missouri State University

Date submitted: 19 Dec 2012 Electronic form version 1.4