University of Texas at San Antonio

Department of Physics & Astronomy

Dr. Fabio Urbani

Department of Engineering, UT Brownsville

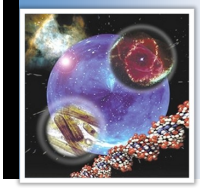
Friday, January 28, 2011

Time: 3:00 p.m.-4:00 p.m.

BB 3.04.18

Experimental Analysis of Double-Negative Two-Dimensional Periodic Passive Arrays

Since 1967 when Victor Veselago theoretically predicted that special materials could exhibit a negative refractive index, engineers and researchers around the world have set out to study the advantages that could originate from such an unusual property. Recent years have seen an unprecedented growth in the research directed at the use of novel engineered materials containing characteristics not found in nature. This research includes the design of microwave antennas and devices. The studies in this area have shown increased directivity and bandwidth, reduced observability, and frequency shift. Out of the numerous classifications and characterizations that have been proposed in literature, this presentation will focus on left-handed metamaterials. The concept of left-handed or double-negative (DNG) materials plays an important role in science and technology for its broad range of applications including artificial dielectrics; lens; absorbers; antenna structures; optical and microwave components; frequency selective surfaces; and composite materials. DNG materials are artificial structures with electromagnetic properties different from conventional materials. Both their permittivity and permeability can be negative over a certain frequency range. A DNG material consists of a periodic assembly of identical conductive elements arranged in a two-dimensional array. In this talk the numerical and experimental analysis of a periodic planar structure designed and manufactured in the Applied Microwave & Electromagnetic Laboratory at UTB are presented. Several simulations and measurements comparisons will be shown along with possible applications of such new artificial material.



Department Contact Information
Dr. Andrey Chabanov • 210.458.6426 • Andrey.Chabanov@utsa.edu
Laurie De La Paz • 210.458.4425 • Laurie.DeLaPaz@utsa.edu
http://physics.utsa.edu/