Abstract Submitted
for the SES10 Meeting of
The American Physical Society

Investigation of multiplexed plasmonic structure metamaterials with equivalent transmission line model BOYANG ZHANG, JUNPENG GUO, Department of Electrical and Computer Engineering, University of Alabama in Huntsville, Huntsville, AL 35899, STUART YIN, Department of Electrical and Computer Engineering, Pennsylvania State University, University Park, P — We report our investigation of multiplexed structure metamaterials with the equivalent coupled transmission line model. In this metamaterials, two plasmon resonance elements are multiplexed in each unit cell of the periodic structures. Symmetrically multiplexed structures give increased spectral bandwidth and the non-symmetrically multiplexed structures give the band splitting property. By varying the gap size between the multiplexed elements, we find the plasmonic coupling affects the spectral property of the multiplexed structure metamaterials. We have developed a coupled transmission line model that can successfully model the multiplexed structure metamaterials when far-field coupling dominates, but the coupled transmission line model cannot describe the multiplexed plasmonic structures when the strong near-field coupling occurs.

Boyang Zhang
Department of Electrical and Computer Engineering,
University of Alabama in Huntsville, Huntsville, AL 35899

Date submitted: 27 Sep 2010 Electronic form version 1.4