

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Magnetic behavior of misaligned cut-wire pairs in an extended unit cell V. T. T. THUY, N. T. TUNG, Hanyang University, Korea, V. D. LAM, Institute of Materials Science, Vietnam, J. Y. RHEE, Sungkyunkwan University, Korea, S. J. LEE, J. W. PARK, Y. P. LEE, Hanyang University, Korea — Many recent works have demonstrated that the interactions between constituent elements in metamaterials can lead to intriguing phenomena that do not exist in the conventional structures with uncoupled elements. Therefore, this issue has attracted a considerable interest in the perspectives of new physical properties and novel applications. It is well known that cut-wire pair (CWP) has been widely recognized as a magnetic resonator providing the negative permeability for metamaterials. In this study, we found that there exists the strong effect of the interaction between closest elements on the resonance behavior of CWP structure. Based on that understanding, we investigated the influence of interaction on the magnetic response of the CWP structure with an extended unit cell, which consists of four identical CWPs. We systematically arranged their relative positions in the cell, i.e., intentionally misaligned two of the four CWPs. The results show that the misalignments of CWP in the extended cell can lead to multiple magnetic resonances, which are not observed in the conventional structure. Therefore, this study suggests an additional degree of freedom to control the magnetic response of CWP metamaterials.

Kiwon Kim
Sunmoon University

Date submitted: 19 Nov 2009

Electronic form version 1.4