Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Meta-Atom Interactions and Coherent Response in rf SQUID Metamaterials[1] MELISSA TREPANIER, DAIMENG ZHANG, University of Maryland, OLEG MUKHANOV, Hypres, PHILIPP JUNG, SUSANNE BUTZ, Karlsruhe Institute of Technology, V.P. KOSHELETS, IREE, ALEXEY USTINOV, Karlsruhe Institute of Technology, STEVEN ANLAGE, University of Maryland — An rf SQUID (radio frequency superconducting quantum interference device) metamaterial can be modeled as an array of coupled nonlinear oscillators with resonant frequencies that are extremely tunable with temperature, dc magnetic field, and rf current. The metamaterial is driven by an external rf field and its response to that field defines its metamaterial characteristics. In the presence of disorder (nonuniform applied dc magnetic flux for instance) the SQUIDs may or may not oscillate coherently in response to the external rf field. Since we are interested in metamaterial applications, a strong coherent response is desirable. The coherence is affected by a variety of factors including flux uniformity, array size, degree of coupling, strength of the driving field, and uniformity in SQUID parameters. In this talk we will present experimental and simulation results exploring the effect of these parameters on coherence.

[1]This work is supported by the NSF-GOALI and OISE programs through grant # ECCS-1158644, and CNAM.

Melissa Trepanier
University of Maryland

Date submitted: 12 Nov 2014 Electronic form version 1.4