Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Investigation of nanogap localized field enhancement in gold plasmonic structures DESALEGN TADESSE DEBU, STEPHEN BAUMAN, CAMERON SAYLOR, University of Arkansas, ERIC NOVAK, Shippensburg University, DAVID FRENCH, JOSEPH HERZOG, University of Arkansas — Nanogaps between plasmonic structures allow confining the localized electric field with moreenhancements. Based on previously implemented two-step lithography process, we introducea nano-masking technique to fabricate nanostructrues and nanogaps for various geometrical patterns. This new method can fabricate gold nanostructures as well as nanogaps that are less than 10nm, below the limiting scale of lithography. Simulation from finite element method (FEM) shows strong gap dependence of optical properties and peak enhancement of these devices. The fabricated plasmonic nanostructure provides wide range of potential future application including highly sensitive optical antenna, surface enhanced Raman spectroscopy and biosensing.

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Date submitted: 14 Nov 2014 Electronic form version 1.4