

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Metal films with arrays of subwavelength holes show infrared spectral and plasmonic sensitivity to material in the holes JAMES COE, JOSEPH HEER, KATHERINE CILWA, MARVIN MALONE, LLOYD CORWIN, The Ohio State University — Experiments and FDTD calculations show that infrared (IR) absorption spectroscopy and IR transmission resonances of metal films with arrays of subwavelength holes (mesh) are more sensitive to material in the holes as opposed to material on the front or back surface of the mesh. The basic optical physics of the transmission resonances will be discussed including determinations of front-back coupling and surface plasmon (SP) dispersion curves. Applications including enhanced IR absorption spectroscopy of nanocoatings, catalytic reactions, and individual dust particles in the 1-5 micron diameter range will be discussed. Finally, the interaction of an IR SP-mediated resonance with a vibration of molecules in a mesh coating will be presented.

James Coe
The Ohio State University

Date submitted: 03 Dec 2008

Electronic form version 1.4