

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Mid Infrared Beam Steering Using Plasmonic Structures DAVID ADAMS, DANIEL WASSERMAN, University of Massachusetts at Lowell — The interaction of electromagnetic radiation with periodic features on metal surfaces has received a great deal of attention in recent years. The far-field transmission properties of a sub-wavelength aperture can be controlled when periodic grooves are formed on the exit surface, allowing the shape and directionality of the transmitted beam to be altered. This phenomenon is a result of surface plasmon polaritons propagating along the metal surface and recoupling to photons which are phase mismatched with respect to the transmitted beam. The resulting interference pattern is dependent on the wavelength of the exciting beam, the geometry of the periodic surface structure, and the dielectric permittivity of the materials at the boundary. Here we present simulations using finite element analysis which demonstrate the steering of the beam transmitted through the metal slit as the permittivity of the surrounding material is modified.

Daniel Wasserman
University of Massachusetts at Lowell

Date submitted: 21 Nov 2008

Electronic form version 1.4