Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Mapping of the optical emission in the vicinity of the surface of a subwavelength aperture flanked by periodic grooves in a gold film IAN C. SCHICK, JAMES T. MARTINEAU, REUBEN T. COLLINS, P. DAVID FLAMMER, Colorado School of Mines, RUSSELL E. HOLLINGSWORTH, ITN Energy Systems, Inc — Enhanced optical transmission through subwavelength apertures surrounded by periodic features has been a subject of great recent interest. Equally important are the emission characteristics of these structures. Transmission enhancement has typically been observed as peaks in the spectral dependence of transmission measured in the far-field. Here we use near-field scanning optical microscopy to spatially map the optical emission in the vicinity of the aperture and as emission propagates into the far field. We show the dependence of the emission pattern on the wavelength of the incidence in addition to structural parameters, such as spacing between the grooved regions and the aperture and the spatial period of the grooves. We observe that the emission pattern is governed by interference effects between emission from the aperture and scattered light from adjacent surface features. This material is based on work supported by the National Science Foundation under Grant No. DMI-0522281.

Russell Hollingsworth
ITN Energy Systems, Inc

Date submitted: 20 Nov 2006 Electronic form version 1.4