

Abstract Submitted  
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**Polarization and hole-shape dependence of the transmission of sub-wavelength hole arrays**<sup>1</sup> KWANGJE WOO, SINAN SELCUK, ARTHUR F. HEBARD, DAVID B. TANNER, Department of Physics, University of Florida — We have measured the infrared and visible transmission of arrays of holes in silver films, to study the effects of hole shape and hole spacing as a function of the polarization of the light. The anomalous transmission enhancement of sub-wavelength hole arrays in metal films has been attributed to surface plasmon polaritons (SPPs) but this picture is not enough to explain the dependence of hole shape on the transmission due to the long wavelength approximation. We have measured the transmission of arrays of square holes, rectangular holes, and slits in a silver film. We studied the effect of different hole shapes on the enhanced transmission as a function of the polarization angle of the light and found a strong dependence on the hole shape and the polarization angle. In addition, transmission spectra of an array of square holes on a rectangular grid will be presented.

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