

Abstract Submitted
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Transmission properties of an array of sub-wavelength holes in a metal film¹ KWANGJE WOO, SINAN SELCUK, ARTHUR F. HEBARD, DAVID B. TANNER, Department of Physics, University of Florida, Gainesville, FL 32611 — It is known that the intensity of light transmitted through an array of holes can be surprisingly high at certain wavelengths, even when the holes are of sub-wavelength scales. The enhanced transmission is attributed to a coupling of surface plasmons on the two sides of the film. We have studied the systematics of this transmission of hole arrays in silver films. We have observed a scaling of the transmission wavelength with the hole spacing, and found that the effect can be observed at long wavelengths. We have also studied the effect of the angle of incidence of the light and found a very strong dependence of the transmission on this angle. In addition, significant polarization dependence is observed. Finally, the effect of the dielectric media on the surface-plasmon-enhanced transmittance will be addressed.

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