Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

**Polarization-independent extraordinary optical transmission in one-dimensional metallic gratings** YUEHUI LU, MINHYUNG CHO, YOUNG-PAK LEE, Hanyang University, Korea, JOOYULL RHEE, Sungkyunkwan University, Korea — Extraordinary optical transmission (EOT) is a unique effect that light is transmitted with an efficiency greater than unity when it is normalized to the area of grooves or holes. In this work, the EOT of both transverse-electric (TE) and transverse-magnetic (TM) polarizations was investigated for sub-wavelength metallic gratings by the rigorous coupled-wave analysis, implemented as the Airy-like internal reflection series. Generally, the EOT is achievable for TM polarization due to the excitation of coupled surface plasmon polaritons (SPPs), whereas the SPP-produced EOT for TE polarized light is impossible because of the absence of SPPs for this polarization. However, the TE-polarized EOT produced by cavity modes is available. In this work, the polarization-independent EOT is exhibited in the pure metallic gratings with broad slits without need for a specific dielectric filler in the grooves. The design proposed in this work simplifies the realization of gratings that possess the polarization-independent EOT.

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Date submitted: 20 Nov 2008 Electronic form version 1.4