Abstract Submitted
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A new theoretical model for enhanced optical transmission through thin films[1] ELI LANSEY, ISROEL MANDEL, Department of Physics, Graduate Center and City College of the City University of New York, JONAH GOLLUB, Phoebus Optoelectronics, DAVID CROUSE, Department of Electrical Engineering, City College of the City University of New York — We present a new theoretical approach for modeling the resonant properties and transmission through subwavelength apertures penetrating metal films. We show that standard cavity mode theory can be applied to an effective resonant cavity whose dimensions are determined by the aperture dimensions in conjunction with the evanescent decay lengths of the of diffracted waves. This method predicts the dependence on variation in both the periodicity of the holes and the film thickness over a wide range of values. It further provides a physical mechanism for the enhanced transmission observed in periodic aperture arrays.

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