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Junshan Lin* (jz10097@auburn.edu), Department of Mathematics and Statistics, Auburn University, Auburn, AL 36849. *Analysis and Computation of Electromagnetic Field Enhancement for Metallic Nano-gaps.*

There has been increasing interests in electromagnetic field enhancement and extraordinary optical transmission effect through subwavelength apertures in recent years, due to its significant potential applications in biological and chemical sensing, spectroscopy, terahertz semiconductor devices, etc. In this talk, I will present a quantitative analysis for the field enhancement when an electromagnetic wave passes through small metallic gaps. In particular, we show that enormous electric field enhancement occurs inside the gap, and the enhancement factor depends explicitly on the geometry of the metallic structure. The analysis also leads to a natural asymptotic method for numerical approximation of the electromagnetic fields. (Received January 30, 2015)