Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Plasmon Enhanced Transparency of a Metallic Film on Silicon TIANYI SUN, Department of Physics, Boston College, YANG WANG, School of Physics and Telecommunication Engineering, South China Normal University, ZHIFENG REN, KRZYSZTOF KEMPA, Department of Physics, Boston College — Low electrical resistivity and high optical transparency are highly desirable for thin films employed in various applications in electronics, optics, solar photovoltaics. In subwavelength scales, plasmon resonance can help electromagnetic waves to propagate through porous metallic films. In this work, we first employ a theory of effective dielectric response, and then quantitative simulations based on finite-difference-frequency-domain (FDFD) and finite-difference-time-domain (FDTD) methods, to understand and demonstrate physics of this effect. We show, that a nanoscopically perforated, yet continuous planar metallic film on silicon, can be designed to be highly transmissive in the entire visible range.

Tianyi Sun
Boston College

Date submitted: 11 Nov 2011 Electronic form version 1.4