

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Calculations of optical properties of nanohole systems in metallic films PETER JOHANSSON, Orebro University, VLADIMIR MILJKOVIC, MIKAEL KALL, Chalmers University — We present a computational study of the optical properties of systems of nanohole system in thin (the typical thickness is less than 100 nm) noble metal films. The Green's tensor technique adopted to layered systems forms the analytical framework to the calculations. We have studied individual holes as well as several interacting holes, and calculated quantities related both to far-field properties such as scattering cross sections and near fields and near-field properties such as resonance energy transfer between molecules. The resonance properties of nanoholes are determined by their size and shape[1]. The interaction between two holes can, at a basic level, be understood as a dipole-dipole interaction between the holes, however, the interaction strength is strongly modulated by the properties of the surface plasmons of the metal film[2].

[1]. B. Sepulveda *et al.*, Opt. Express **16**, 5609 (2008).

[2]. J. Alegret, P. Johansson, and M. Käll, New J. Phys.**10**, 105004 (2008).

Peter Johansson
Orebro University

Date submitted: 20 Nov 2009

Electronic form version 1.4