

Abstract Submitted  
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**Plasmon hybridization in nanoshells near conducting films** FEI LE, PETER NORDLANDER, Rice University — In a recent publication[1], the plasmon hybridization method was used to calculate the plasmon energies of a solid nanosphere near a semi-infinite metallic surface[1]. In the present work, we extend this method to the more general case of plasmon resonances of nanoshells interacting with metallic films. A finite film thickness introduce a dispersion of the surface plasmons which can qualitatively change the nature of the plasmon interactions compared to the case of a semi-infinite surface. We show that the free-electron densities of the nanoparticle and the film, the nanoparticle-surface separation, the film thickness and the aspect ratio of the nanoshell are crucial parameters in determining the plasmon frequencies of the nanoparticle/film system. The plasmon energies can either redshift or blueshift when these parameters change. The shifts can be intuitively understood from hybridization of the bare nanoparticle and thin film plasmons. [1] P. Nordlander and E. Prodan, Nano. Lett. 4(2004)2209

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