Abstract Submitted
for the TSF06 Meeting of
The American Physical Society

Plasmonic Band Gap Manipulation in Silver Nanogratings ERIN BEITEL, JENNIFER STEELE, Department of Physics and Astronomy, Trinity University — Metallic structures with subwavelegth features can support optical resonances of their conduction electrons, called surface plasmons. On periodic substrates, it is possible to excite simultaneous counterpropagating plasmon waves, which superimpose to form a standing wave. This standing wave has two possible energetic configurations, which defines a plasmonic band gap in the plasmon dispersion. In this study, silver nanogratings were functionalized with different carbon chain length alkanethiols so that the surface chemistry remains constant as the dielectric environment of the silver wires was changed. By monitoring both the surface plasmon energy and the plasmonic band gap, we hope to differentiate between the effects of the surface chemistry and the dielectric environment. The silver nanogratings were fabricated using a passivative microcontact printing method. Functionalization was done with alkanethiols of varying carbon chain lengths to create self-assembled monolayers (SAMs). We have tracked the effect of these molecules on the plasmon energy and band gap.

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Date submitted: 12 Sep 2006 Electronic form version 1.4