Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Two photon excitation fluorescence from Ag nanotriangles and nanohexagons CHI-YU JAO, Virginia Tech, BRENDEN MAGILL, Institute for Critical Technology and Applied Science at Virginia Tech, HANS ROBINSON, Virginia Tech — We report on measurements of two photon excitation fluorescence (TPEF) from arrays of silver nanotriangles and nanohexagons fabricated by nanosphere lithography. The silver nanoparticles exhibit localized surface plasmon resonances (LSPRs) that depend on the size, shape and aspect ratio of the particles. When the particles are excited by femtosecond pulsed laser light resonant with the LSPRs, they emit TPEF with significantly higher intensity than when excited off resonance. Moreover, if the light intensity is turned up sufficiently to cause some of the particles to melt into spherical particles, we observed an increase in the TPEF from the spheres by as much as an order of magnitude, even though their LSPRs are no longer resonant with the laser. Finally, we note that the silver particles also generate light at the second harmonic of the laser frequency, although the efficiency of this process depends strongly on the dielectric environment of the silver particles, which is not the case for the TPEF.

Brenden Magill
Institute for Critical Technology and Applied Science at Virginia Tech

Date submitted: 09 Nov 2012 Electronic form version 1.4