

IN SILICO OPTIMIZATION OF 3D PLASMONIC CRYSTALS. Brian Covello, Ryan Petit, and Jason M. Montgomery, Department of Chemistry, Florida Southern College, 111 Lake Hollingsworth Dr., Lakeland, FL 33801.

Interactions of light and metallic nanostructures, including metal nanoparticles and structured metal films, have been the focus of much recent attention. These interactions can give rise to both localized and propagating surface plasmons (SPs), which are collective excitations of electrons near a metal / dielectric interface. SPs can be very intense near the interface, making metallic nanostructures interesting for a variety of applications in optics, chemical and biological sensing, and optoelectronics. The nanostructures presented in this talk are periodic arrays of conical nano-frustums (NFs) and elliptical nanowells (NWs). Using the finite-difference time-domain (FDTD) method, we solve Maxwell's curl equations to model the interactions of light with the NF and NW arrays and very geometries to optimize the enhancement of the incident electric field intensity for applications in surface enhanced Raman spectroscopy (SERS).