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Finite-difference time-domain studies of the optical properties of nanoshell dimers CHRIS OUBRE, Rice University, PETER NORDLANDER, Rice University — The polarization dependence of the optical properties of metallic nanoshell dimers is investigated using the Finite Difference Time Domain (FDTD) method[1]. The results show that maximal coupling between the nanoshells in a dimer occur when the electric field of the incident pulse is aligned parallel to the dimer axis. Both the extinction cross sections and the electric field enhancements associated with excitations of the dimer plasmons are shown to be strongly dependent of the polarization of the incident light. To investigate the applicability of nanoshell dimers as SERS substrates, we integrate the fourth power of the electric fields around the surfaces of the nanoparticles for various wavelengths, and as a function of dimer separation. Additionally we present an investigation of how the optical properties of nanoshells are influenced by defects on their surfaces. [1] C. Oubre and P. Nordlander, J. Phys. Chem. B 108(2004)17740- 17747

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