C. Michael Hseih

“Study of Resonant Cavities in vertical Indium Tin Oxide (ITO) nanorod arrays using FDTD”

Finite Difference Time Domain (FDTD) method is used to study the optical response of the cavities formed by vertical nanorod arrays made of Indium Tin Oxide (ITO), a transparent conducting Oxide. Surface plasmon polaritons can be excited at the interface between the ITO nanorods and dielectrics. Plasmonic resonance is observed at certain frequencies, and follows a trend regarding different height and separation of the ITO nanorods. Field intensity is enhanced inside the cavities due to the cavity effect of the ITO nanorods. Due to these properties, Nanorod arrays have high potential for applications such as surface-enhanced Raman spectroscopy and refractive index difference sensing devices.