Nanowires filled with nanoparticles: 
application to solar cells

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Abstract

Gold nanoparticles have interesting properties of nano-antennas that focus the radiation field in relatively small, much smaller than the wavelength of radiation, regions. Optical and electronic properties of nanowires experiencing huge field enhancement can be modified due to this plasmonic interactions. We have developed generalized Mie theory to demonstrated the effect of enhancement of electric field near gold nanoparticles and study novel optical and electronic properties of these new structures: nanotubes with the pores filled with metal nanoparticles and nanowires with metal nanoparticles as inclusions on their surface. In the talk, we discuss the applications of such novel nanoscale hybrid metal/semiconductor composite in applications such as sensitive sensors and efficient photovoltaics.