Theoretical investigation for the enhanced absorption of nanostructured semi-conductor materials

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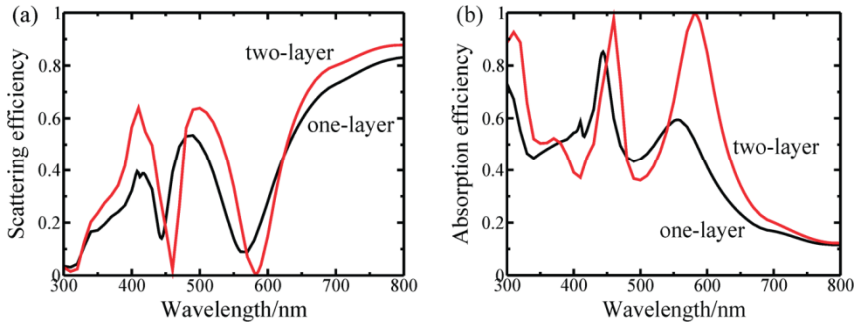
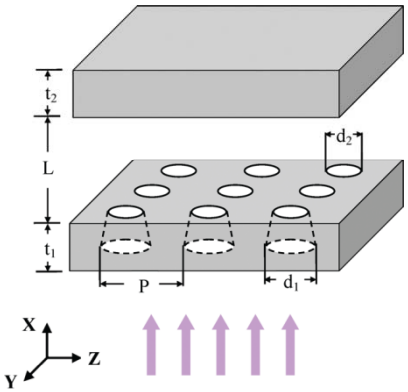
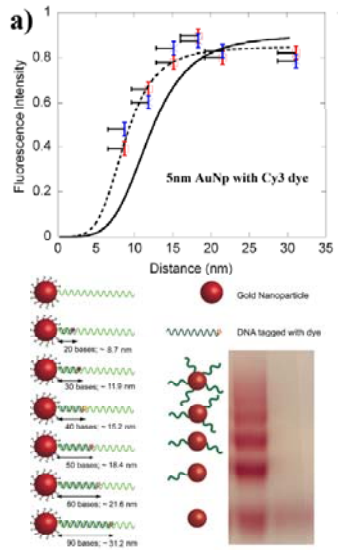
Fig. 1





1. Efficient and tunable light trapping thin film: We numerically demonstrated that light can be trapped between a two layer silver film at tunable wavelengths with unit efficiency. Fig. 1 shows the scattering and absorption spectra of the film and the sketch of the structure.

Fig. 2



2. Energy transfer between metallic nanoparticles and quantum dots and fluorophore molecules. We developed a coupled dipole method to study the energy transfer between metallic nanoparticles and quantum dots and fluorephore molecules. Fig. 2 shows quantitative agreement between the experimentally measured signals (bars) and the theoretically calculated data (solid curve).