

The extinction properties in gain plasmonic nanoparticles

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The extinction efficiency that is the sum of the absorption efficiency and scattering efficiency of the incident light can be enhanced by metal nanoparticles for localized surface plasmon resonance [1]. Therefore, similar effects are expected at gain-assisted surface resonances and plasmon singularities. At the same time, all kind of plasmon resonances can be effectively sustained by plasmonic nanostructures [2-6]. The plasmonic nanostructures are composed of a gain core [7] and a metallic shell. We have numerically calculated the extinction efficiencies of the coated gain sphere by a plane wave. Numerical results show that the extinction efficiencies does not necessarily decrease and the resonance wavelength is redshifted, as the coating thickness decreases. In Fig. 1, the extinction efficiencies of the gain core coated with different coating thickness are given. In addition, the extinction properties of a gain sphere covered with different nanoscale metal by a plane wave are also can be obtained.

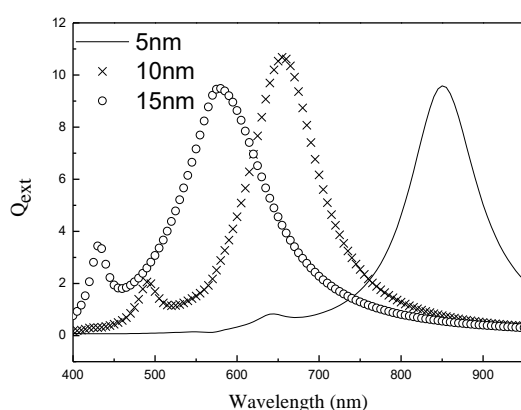


Fig 1. Extinction properties of a gain sphere (with radius of 50 nm) coated with different thickness of Au coating

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