

# Shape of Fano resonance line spectra calculated for one-dimensional silver nanorods

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Using electrodynamics tools, we investigated the optical properties of a single silver rod. We found that when the rod length is larger than 200 nm, a Fano shape resonance can be observed at wavelengths of around 480 nm. We examined the mechanism leading to the Fano resonance and found that the asymmetric shape can be caused by the interference between two excited dipoles or between one excited dipole and one quadrupole. The results are very helpful for controllable wave propagation in a nano-device.

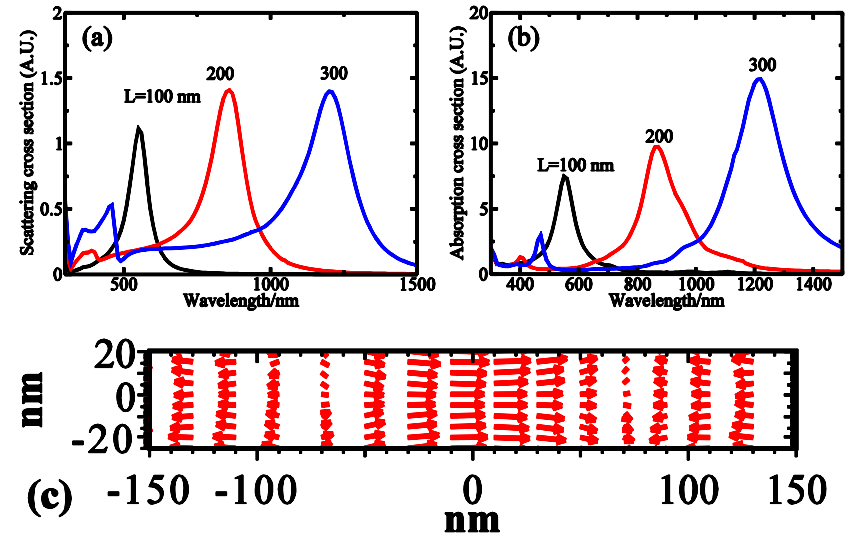


Figure 1. (a) and (b) Scattering and absorption spectra of silver rods of different lengths. (c) Electric field vector plot inside a rod of 300 nm length at 480 resonance wavelength, the plane is in the XY plane and through the rod center.