Surface plasmons assisted light propagation and focusing

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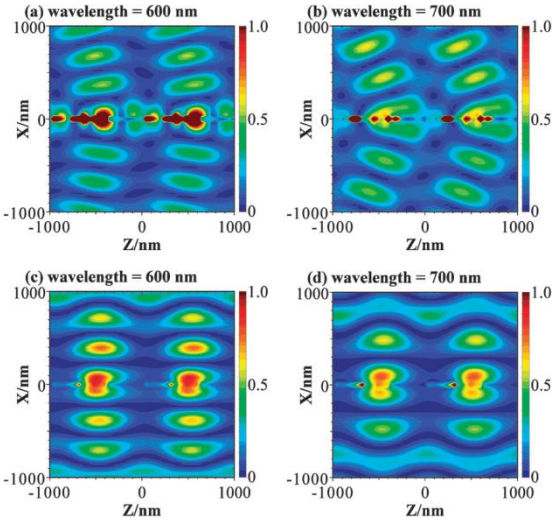
Fig. 1



1. Using a silver film composed of periodic triangular prisms, we numerically demonstrated that electromagnetic waves may controllably propagate along different directions depending on the incident polarization direction. When the incident polarization is in the plane of incidence and the surface plasmons are excited, the refracted light ray propagates along the same side of the surface normal as the incident wave. When the incident polarization is perpendicular to the plane of incidence, the refracted light ray always propagates on the opposite side of the surface normal.

2. Using numerical simulations, we demonstrate the possibility of creating controllable hot spots through proper engineering of the plasmonic modes supported by periodic arrays of nanoscale cavities in thin silver films. Enhanced local electric field at the bottom of the cavity provides an efficient optical trap .

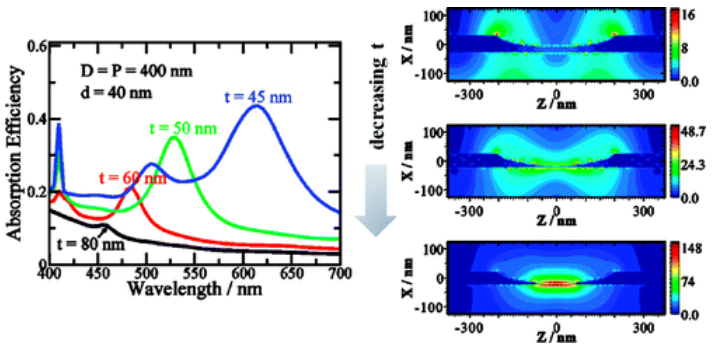


Fig. 2