Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Manipulation of temperature dependence of photothermal response in metal nanoparticles by wavelength detuning[1] S.N. WANI, L. YANG, R. SURESHKUMAR, WASHINGTON UNIVERSITY, SAINT LOUIS TEAM — We investigate the temperature dependence of the absorption cross-section of an ideal Drude like metal, Au and Ag nanoparticles. We show that when Au or Ag nanoparticles held on a SiO_2 substrate are irradiated at the resonance wavelength (at the reference temperature), model predictions for the steady-state temperature can differ substantially from that obtained by treating the absorption cross-section to be temperature independent. Red-shifting of the laser wavelength from the resonance can lead to a monotonic increase in absorption cross-section with near linear increase in the temperature. Potential applications of such photothermal behavior will be discussed.

[1]NSF

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Date submitted: 28 Nov 2009 Electronic form version 1.4