Abstract Submitted
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Plasmon Assisted Heating of Metal Nanoparticles ADAM BUSHMAKER, University of Southern California, DAVID BOYD, California Institute of Technology, RAJAY KUMAR, University of Southern California, DAVID GOODWIN, California Institute of Technology, STEPHEN CRONIN, University of Southern California — Optical heating of Au nanoparticles by light at the plasmonically resonant frequency is studied. Block copolymer lithography is used to create highly uniform monodisperse arrays of Au nanoparticles. Extremely high temperatures and electric fields are produced locally with relatively low intensities of laser light. The heating is quantified using three approaches: melting of glass, dissociation of carbon monoxide, and Stokes/anti-Stokes Raman spectroscopy. Temperatures in excess of 375^oC are observed in the nanoparticles for incident light intensities of less than $7x10^3$ W/cm^2. Anti-Stokes:Stokes Raman spectra of PbO deposited by plasmon assisted chemical vapor deposition (PACVD) [1] on top of the nanoparticles show a heating factor 1570 times larger than a bulk reference sample. We show that temperature rises of this magnitude are consistent with our model of reduced heating at the nanoscale. [1] D. A. Boyd et al, Nano Lett., **6**, 2592 (2006).

Adam Bushmaker
University of Southern California

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