Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Optical pump/x-ray probe studies of lattice parameter evolution in Pt nanoparticles due to sintering and grain growth[1] BRIAN KELLY, AARON LOETHER, Department of Physics and Astronomy, University of Delaware, ANTHONY DICHIARA, ROBERT HENNING, Advanced Photon Source, Argonne National Laboratory, KARL UNRUH, MATTHEW DECAMP, Department of Physics and Astronomy, University of Delaware — An *in-situ* optical pump/x-ray probe technique has been developed to study the evolution in the lattice parameter of nanometer-sized Pt particles as a function of the particle size during sintering and grain growth. In particular, the lattice parameter of the as-prepared nanoparticles was observed to be about 0.4% smaller than the corresponding bulk value in good agreement with the value expected for isolated spherical particles subject only to a simple surface stress. As the as-prepared nanoparticles sinter and grow as a result of the photo-thermal irradiation, however, the evolution in the lattice parameter reflects the effects of both an increasing grain size and the evolving particle-particle interface. As a result, the lattice parameter does not evolve monotonically with increasing grain size.

[1]This material is based upon work supported by the National Science Foundation under Grant No. 1410076.

Brian Kelly
Department of Physics and Astronomy, University of Delaware

Date submitted: 01 Dec 2015 Electronic form version 1.4