Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Measuring optical nonlinearities with pump-probe intracavity phase spectroscopy DAVID CARLSON, JASON JONES, College of Optical Sciences, University of Arizona — A passive femtosecond enhancement cavity (fsEC) is used to make sensitive, time-resolved measurements of phase shifts due to optical nonlinearities. In pump-probe intracavity phase spectroscopy, a strong pump pulse train resonant with a fsEC induces a nonlinear response in a sample which is then detected as a shift of the cavity resonance for a weak counter-propagating probe pulse. Recording this resonant shift allows precise determination of the nonlinear phase shift of the pump pulse relative to the probe. When fsECs are used for high harmonic generation (HHG), a static background plasma can accumulate and frustrate HHG phase matching. To improve the achievable HHG power in these systems it is important to understand the plasma levels and decay timescales. Here we demonstrate the pump-probe technique by measuring the decay of this plasma formed by the ionization of a xenon gas target by the pump pulse.

David Carlson
College of Optical Sciences, University of Arizona

Date submitted: 27 Jan 2012 Electronic form version 1.4