Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

BioCARS: A State-of-the-art Facility for Time-resolved Crystallography with 100ps Time Resolution ROBERT HENNING, TIM GRABER, VUKICA SRAJER, YU-SHENG CHEN, ZHONG REN, University of Chicago, FRIEDRICH SCHOTTE, PHILIP ANFINRUD, National Institutes of Health, KEITH MOFFAT, University of Chicago — BioCARS, a national facility located at the Advanced Photon Source (APS), recently upgraded the undulator beamline (14-ID) to become one of the best facilities in the world for conducting experiments with 100ps time resolution. Improvements in both the x-ray and laser capabilities were required in order to extend experiments into the sub-ns time domain. The more intense and strongly focused x-ray beam was achieved by using a KB mirror pair which provides a focal spot size of 35x90 μm^2 (VxH). The high heat loads that can be achieved with this configuration required the development of a new water-cooled heat-load chopper. The continuously rotating, air-bearing based chopper intercepts the white beam upstream of the mirrors and reduces the heat load on the downstream components by $\sim$99%. BioCARS ultra-fast rotating chopper used for selection of X-ray pulses was modified so individual x-ray pulses (100 ps) could be isolated in the standard operating mode of the APS (24 bunch). A new Spectra Physics picosecond laser system and beam transport optics have been installed and can deliver $\sim$35ps tunable laser pulses to the sample position.

Robert Henning
University of Chicago

Date submitted: 04 Dec 2008 Electronic form version 1.4