

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Commissioning of a high-brightness photoinjector for Compton scattering x-ray sources¹ SCOTT ANDERSON, DAVID GIBSON, MIKE MESSERLY, MIROSLAV SHVERDIN, AARON TREMAINE, FRED HARTEMANN, CRAIG SIDERS, CHRISTOPHER BARTY, Lawrence Livermore National Laboratory, HRISTO BADA KOV, PEDRO FRIGOLA, BRENDAN O'SHEA, JAMES ROSENZWEIG, UCLA Dept. of Physics and Astronomy — Compton scattering of intense laser pulses with ultra-relativistic electron beams has proven to be an attractive source of high-brightness x-rays with keV to MeV energies. This type of x-ray source requires the electron beam brightness to be comparable with that used in x-ray free-electron lasers and laser and plasma based advanced accelerators. We describe the development and commissioning of a 1.6 cell RF photoinjector for use in Compton scattering experiments at LLNL. Injector development issues such as RF cavity design, beam dynamics simulations, emittance diagnostic development, results of sputtered magnesium photo-cathode experiments, and UV laser pulse shaping are discussed. Initial operation of the photoinjector is described and transverse phase space measurements are presented.

¹This work was performed under the auspices of the U.S. Department of Energy by University of California Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

Scott Anderson
Lawrence Livermore National Laboratory

Date submitted: 20 Jul 2007

Electronic form version 1.4