Abstract Submitted
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Development of a high-brightness photoinjector for Compton scattering x-ray sources[1] SCOTT ANDERSON, DAVID GIBSON, FRED HARTEMANN, AARON TREMAINE, Lawrence Livermore National Laboratory, HRISTO BADAKOV, PEDRO FRIGOLA, BRENDAN O'SHEA, JAMES ROSENZWEIG, University of California, Los Angeles, CHRISTOPHER BARTY, Lawrence Livermore National Laboratory — 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 of a 1.6 cell RF photoinjector for use in Compton scattering experiments at LLNL. RF cavity design, beam dynamics simulations, emittance diagnostic development, and results of sputtered magnesium photo-cathode experiments are discussed. The photo-cathode drive laser is described and injector performance goals are presented.

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