

Abstract Submitted  
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**LLNL Precision Compton Scattering Light Source: X-band RF Photoinjector and Accelerator Design**<sup>1</sup> ROARK MARSH, S.G. ANDERSON, D.J. GIBSON, S.S. WU, F.V. HARTEMANN, T.L. HOUCK, C. EBBERS, R.D. SCARPETTI, C.P.J. BARTY, Lawrence Livermore National Laboratory, C. ADOLPHSEN, T.S. CHU, Z. LI, S.G. TANTAWI, A.E. VLIEKS, J.W. WANG, T.O. RAUBENHEIMER, SLAC National Accelerator Laboratory — The design and optimization of a Mono-Energetic Gamma-Ray (MEGa-Ray) Compton scattering source are presented. This precision light source with up to 2.5 MeV photon energy is currently being built at LLNL using high gradient X-band accelerator technology in collaboration with SLAC. The design of a high brightness 5.59 cell X-band RF photoinjector will be presented. An “early light” machine has been designed using the 250 pC, 1mm-mrad electron bunches from the photoinjector, a single T53 traveling wave accelerator section, and Joule-class diode pumped laser pulses to produce diagnostic Compton scattered photons. Design of this “early-light” machine will be presented with discussion of the various components, layout considerations, and plans for the full 250 MeV linear accelerator.

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