

Abstract Submitted
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Fiber-Based, Spatially and Temporally Shaped Picosecond UV Laser for Advanced RF Gun Applications¹ C. SIDERS, S. ANDERSON, S. BETTS, D. GIBSON, J. HERNANDEZ, M. JOHNSON, I. JOVANOVIĆ, D. MCNABB, M. MESSERLY, J. PRUET, M. SHVERDIN, A. TREMAINE, F. HARTEMANN, C.P.J. BARTY, LAWRENCE LIVERMORE NATIONAL LAB TEAM — The UV laser system has been specifically designed for advanced rf gun applications, with a special emphasis on the production of high-brightness electron beams for free-electron lasers and Compton scattering light sources. The laser pulse can be shaped to a flat-top in both space and time with a duration of 10 ps FWHM, rise and fall times under 1 ps, and pulse energy of 50 micro-joules at 261.75 nm. A fiber oscillator and amplifier system generates a chirped pump pulse at 1047 nm; stretching is achieved in a chirped fiber Bragg grating; recompression to 1 ps FWHM is achieved with a single multi-layer dielectric grating based compressor. A two stage harmonic converter frequency quadruples the beam. Temporal shaping is accomplished with a Michelson-based ultrafast pulse stacking device with nearly 100% throughput.

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Miroslav Shverdin

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