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Optimization of a Short-Pulse-Driven Si He_αSoft X-Ray Backlighter[1] CHRISTIAN STOECKL, MARK BONINO, CHAD MILEHAM, SEAN REGAN, WOLFGANG THEOBALD, University of Rochester, TINA EBERT, STEFFEN SANDER, TU Darmstadt, Germany — A series of experiments have been performed to improve the brightness of the Si He_αx-ray emission at 1865 eV from a high-energy, short-pulse, laser-driven backlighter target at pulse durations of 20 ps and energies of up to 1 kJ. High backligher brightness is important to maximize the number of photons registered in the detector in radiography experiments and to minimize the background for plasma objects with high self-emission. In this study the emission from low-density foam targets, the effects of a laser prepulse and V-shaped targets were compared to solid-density, flat Si targets. The V-shaped targets showed the best performance with an approx. 5x improvement in time-integrated emission and an x-ray pulse duration of 25 ps with no measurable spectral shift of the Si emission line.

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