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Optimization of 4.7keV X-ray Titanium Sources Driven by 100-ps Laser Pulse JUN XIONG, JIAQING DONG, GUO JIA, WEI WANG, SIZU FU, Shanghai Institute of Laser Plasma, Shanghai, China, WUDI ZHENG, Beijing Institute of Applied Physics and Computational Mathematics — Experiment with thin titanium foils irradiated by two pulses delayed in time is conducted on the Shenguang-II laser facility. The prepulse induces an underdense plasma, after 2ns, the main pulse (λ_L=0.35μm, E_L $\approx$120J, τ_L $\approx$100ps) is injected into the underdense and produced strong line emission from titanium $K-$shell (i.e., He_α at 4.7 keV). Data show that 4.7-keV x-ray emission with the prepulse is approximately two times more intense than that without the prepulse, and can be used as a backlighting source satisfying the diagnostic requirements for dense plasma probing. High quality plasma images are obtained with the backlighting 4.7 keV x-rays in a Rayleigh-Taylor hydrodynamic instability experiment.

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