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Soft x-ray radiography based on X-pinch powered by portable pulse generator STANISLAV CHAIKOVSKY, ANTON ARTYOMOV, ANATOLY FEDUNIN, VLADIMIR FEDUSCHAK, NATALIA LABETSKAYA, VLADIMIR ORESHKIN, NIKOLAY RATAKHIN, ALEXANDER ROUSSKIKH, ALEXANDER ZHIGALIN, Institute of High Current Electronics SB RAS, Tomsk, Russia — The extremely low radiation source size and x-ray pulse duration achievable with x-pinches makes them promising tool for fast backlighting imaging of short living plasmas and for non-damaged imaging of biological specimens using soft x-rays ($0.3 \div 10$ keV). We present a low-scale portable pulse power generator with an x-pinch load especially developed for pulsed soft x-ray radiography. The generator provides a 300-kA current pulse with a rise time of 180 ns with short circuit load. The generator can be placed within a 1x1 m^2 laboratory area. Using diffraction patterns observed with x-pinch made of four molybdenum wires with diameter of 25.4 μm the x-ray source size was estimated to be 0.5-2 μm in the spectral range near 3 keV. Clear soft x-ray backlighting images of different samples with temporal resolution of 2 ns and spatial resolution of few microns at magnification up to 20 were recorded. Using this portable generator with the x-pinch load allows one to realize the x-ray backlighting technique on different installations in different laboratories.

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