

X-Ray Emission From 125 μ m Diameter Aluminium Wire X-Pinches At Currents of 400 kA

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Abstract

Results obtained from aluminium wire x-pinch experiments at a current level of ~ 400 kA, 260 ns risetime, are presented. The x-pinches were made from two 125 μ m diameter wires. The x-pinches typically emitted 15 J of K-shell x-rays in nanosecond duration pulses from hot spots of diameters of ~ 10 μ m or less. Frequently several hot spots were formed in a single discharge. Spectroscopic measurements estimate an electron temperature of about 600 eV. Spatial resolution of typically 10 μ m was obtained in radiographic images. Details of the dynamics of the pinch were obtained from time resolved soft x-ray frames, showing formation of the plasma jet due to the coalescence of the expanding corona plasmas from the x-pinch limbs and ejection of plasma in the direction perpendicular to the x-pinch axis when hot spots were formed.