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Study of Thin Foil Explosion Using Point-Projection Radiography of Hybrid X-Pinch X-Rays[1] T.A. SHELKOVENKO, S.A. PIKUZ, L. ATOYAN, D.A. HAMMER, Cornell University, I.N. TILIKIN, Lebedev Physical Institute — The explosion of thin flat and cylindrical foils has been studied on the BIN (270 kA, 100 ns rise time) and COBRA (1.0 MA, 100 ns rise time) pulsed-power generators using X-ray point-projection imaging to investigate the exploded foil structure dependence on the foil material, thickness, geometry, and current through the foil. The geometry of the experiments and hybrid X-pinch source of soft X-ray radiation enabled better than 3 microns spatial resolution and less then 1 ns temporal resolution on both generators. On the BIN pulser the HXP was used as the main load and 1-15 microns thick and about 2-3 mm long foils were exploded in the return current circuit by 50-60 kA current. Al (4, 15 microns), Cu (1, 10 microns) and Ni (5 microns) foils were used in the experiments. Cylindrical foils 4 microns thick with 0.5 mm diameters were used as the main load on the COBRA generator with the HXP placed in one of two return current rods as the source of radiation for high resolution point-projection radiography. Some common features between explosion of fine wires and foils were observed. The exploded foil structure depended dominantly on the current through the foil.

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