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Experimental investigation of dynamic fragmentation of laser shock-loaded by soft recovery and X-ray radiography. JIANTING XIN, WEIHUA HE, GENBAI CHU, YUQIU GU, Research Center of Laser Fusion, China Academy of Engineering Physics — Dynamic fragmentation of metal under shock pressure is an important issue for both fundamental science and practical applications. And in recent decades, laser provides a promising shock loading technique for investigating the process of dynamic fragmentation under extreme condition application of high strain rate. Our group has performed experimental investigation of dynamic fragmentation under laser shock loading by soft recovery and X-ray radiography at SG prototype laser facility. The fragments under different loading pressures were recovered by PMP foam and analyzed by X-ray micro-tomography and the improved watershed method. The experiment result showed that the bi-linear exponential distribution is more appropriate for representing the fragment size distribution. We also developed X-ray radiography technique. Owing to its inherent advantage over shadowgraph technique, X-ray radiography can potentially determine quantitatively material densities by measuring the X-ray transmission. Our group investigated dynamic process of microjetting by X-ray radiography technique, the recorded radiographic images show clear microjetting from the triangular grooves in the free surface of tin sample.

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