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Experimental study of microjetting from triangular grooves in laser shock-loaded samples CAROLINE ROLAND, THIBAUT DE RESSEGUIER, Institut Pprime, CNRS, ENSMA, 86961 Futuroscope, France, EMILIEN LESCOUTE, ARNAUD SOLLIER, CEA, DAM, DIF, 91297 Arpajon, France, DIDIER LOISON, IPR, CNRS, Universite de Rennes 1, 35042 Rennes, France, LAURENT BERTHE, PIMM, ENSAM-ParisTech, 75013 Paris, France, GABRIEL PRUDHOMME, PATRICK MERCIER, CEA, DAM, DIF, 91297 Arpajon, France
— When a shock wave interacts with a free surface, geometrical defects such as scratches, pits or grooves can lead to the production of high velocity, micrometer-size debris. Because their ballistic properties are a key safety issue for a variety of applications involving high pressure dynamic loading such as pyrotechnics, and because these debris may inhibit surface measurements commonly used in shock physics, this process sometimes referred to as "material ejection" or "microjetting" has motivated extensive research work for many years. Recently, we have started a systematic investigation of microjetting under laser driven shock loading of thin metallic samples with calibrated grooves in their free surface. Transverse shadowgraphy and PDV measurements provide jet velocities for different metals, various groove angles, over a range of shock pressure, both below and above shock-induced melting. Besides, the short duration of pressure application allows partial recovery of both samples and ejecta, which provides original insight into the early stage of jet formation as well as spall fracture in such non-planar geometries.

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