Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Ejection of debris cloud from shock-loaded tin melted on release or on compression LOIC SIGNOR, LMPM ENSMA - CEA Valduc, GILLES ROY, CEA Valduc, THIBAUT DE RESSEGUIER, LCD ENSMA - CNRS, ANDRÉ DRAGON, LMPM ENSMA - CNRS, CEA VALDUC TEAM, LMPM - ENSMA / CNRS TEAM, LCD - ENSMA / CNRS TEAM — A triangular shock-wave of sufficient intensity propagating in a metal sample may induce melting. When it reaches the free surface, tensile stresses are generated in the liquid state and lead to the creation of an expanding cloud of liquid debris. This phenomenon called micro-spalling consists of a dynamic fragmentation process in the melted material. Relevant data are still few but important for developing robust and physics-based models. Plate impact experiments have been performed on tin to explore this phenomenon. The breakout shock pressures range from 18 to 60 GPa, corresponding to increasing levels of melting. The so- called Asay window technique is employed to infer some kinematical properties of the debris cloud. The velocity of a LiF window impacted by tin ejecta is measured using Velocity Interferometer System for Any Reflector. Influence of shock pressure and gap distance between the target and the window has been investigated. Measurement has been compared to one- dimensional hydrocode simulation using a multiphase equation of state.

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Date submitted: 24 Feb 2009 Electronic form version 1.4