Abstract Submitted
for the SHOCK17 Meeting of
The American Physical Society

Impacting brittle materials using a designed fast indentation device W. MIRIHANAGE, University of Manchester, M. OLBINADO, ESRF, N.K. BOURNE, University of Manchester, C. RAU, Diamond Lightsource, A. RACK, ESRF — Material failure is determined by a suite of deformation mechanisms with differing kinetics operating together and presented an integrated response to an observer. To elucidate processes requires separating one from another in order to construct physically-based descriptions of behaviour. Observing a material where failure processes are controlled by a designed impulse and are at a suitable scale offers the possibility of separating operating mechanisms. A highly reproducible synchronised loading test frame has been developed by Diamond and Manchester. It has already been fielded at the ESRF and shown useful results using ultra-high speed single bunch image mode on simple test problems. Now that the device has been proven, we show studies on the compression and fracture of glass and quartz. The results indicate several modes of failure within the targets and emphasise the need for further fast radiography to elucidate failure mechanisms in solids.

N.K. Bourne
University of Manchester

Date submitted: 24 Feb 2017 Electronic form version 1.4