Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

**Study on Dynamic Compression Properties of K9 Glass with Doppler Pins Array Measurements** HU CHANGMING, WANG XIANG, CAI LINGCANG, LIU CANGLI — K9 glass is one of archetypal brittle materials for studies of dynamic fracture, failure wave, and so on. This paper presented the dynamic compression properties of K9 glass under uniaxial strain condition. Experimental sample is K9 glass with internal pre-existed defects, and the shape of pre-existed defects is disc with less than 0.5 mm diameter. All tests were conducted by power gun with 37 mm diameter chamber. Doppler Pins array with high space-time resolutions, which consists of sixteen pins in range of 2 mm line length, were applied to measure the particle velocity histories in different positions at the sample rear surface, and the space-resolution is 127 $\mu$m, Experimental results show failure waves initiate at internal micro-surfaces of the sample under shock loading, and the dynamic stress concentration is likely attributed to be a physical mechanism of the initiation of the failure wave. These defects that by the controlled laser irradiation in advance are some internal micro-surfaces. Meanwhile, the experimental results show that internal micro-surfaces of the sample have influence on the elastic precursor wave decay.

Hu Changming

Date submitted: 27 Jan 2009 Electronic form version 1.4