

Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

Effects of Grain distribution anisotropic on dynamic damage of ultrapure aluminum¹ MEILAN QI, CHAO LUO, DUAN FAN, SHENG ZHONG, School of Science, Wuhan University of Technology, Wuhan, Hubei, HONGLIANG HE, National Key Laboratory of Shock Wave and Detonation Physics, Institute of Fluid Physics, CAEP, Mianyang, Sichuan — Based on Velocity Interferometer System for Any Reflector (VISAR) and “soft-recovered” technique of samples, incomplete spall experiments have been conducted for two groups of samples from the same ultrapure aluminum rod but different cutting direction. The sample cut from the direction parallel to the axis is called “longitudinal-cutting sample” and the sample cut from the direction perpendicular to the axis is called “cross-cutting sample.” By comparing the free surface velocity profile and damage of two groups of samples, the vast discrepancies in the two groups of samples have been discussed in detail. For the samples in a group, the pullback velocity changes very small with increasing impact pressure when samples spall incompletely. But for the samples in different groups, the pullback velocity has difference of 39 m /s with the same impact pressure. Moreover, there are the same damage distribution trends in the same groups of samples, such as voids will coalescence along to the impact direction in the cross-cutting samples. But there are large damage distribution discrepancies in the different groups of samples with the same impact pressure.

¹This work supported by the National Natural Science Foundation of China (Grant No. 10876014).

Meilan Qi
School of Science, Wuhan University of Technology, Wuhan, Hubei

Date submitted: 17 Feb 2011

Electronic form version 1.4