Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Void configuration effect on coalescence in single crystal copper under shock loading DENG XIAOLIANG, ZHU WENJUN, HE HONGLIANG, SONG ZHENFEI, CUI XINLING, NATIONAL KEY LABORATORY OF SHOCK WAVE AND DETONATION PHYSICS TEAM — Void coalescence is one of most critical stages during ductile fracture and is related with many factors. The configuration effect on coalescence has been investigated by means of molecular dynamics (MD) simulations in this paper. The void configuration is represented by θ, which is the angle between the connected line of the voids and the shock direction. Using four different void configurations, microscopic mechanism of coalescence was observed and analyzed under 15.7GPa shock strength. The results show that the coalescence process is consistent with phenomena observed in experiment of ductile fracture. Moreover, the coalescence is most easy to occur when the θ equals 60 degree. The theory model was proposed and explained simulations results very well.

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Date submitted: 17 Feb 2009 Electronic form version 1.4