

Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

MD Simulation of Dislocation Behavior in KCl under Shock Compression TAKAHIRO KINOSHITA, TSUTOMU MASHIMO, Kumamoto University, KATSUYUKI KAWAMURA, Tokyo Institute of Technology, MASHIMO LABORATORY AND KAWAMURA LABORATORY COLLABORATION — MD simulations of dislocation behavior in KCl under uniaxial compression are carried out to discuss the elastoplastic transition under shock compression. The dislocations proceeded along to 45 degrees to the uniaxially compressed direction due to the displacement of atomic lines. This result is consistent with the VonMises hypothesis that the shear stress along 45 degrees to uniaxial stress is maximum. Simulation results also showed that the stress, which dislocations started to move under the uniaxial compression along the $\langle 111 \rangle$ axis direction, was larger than other ones along the $\langle 100 \rangle$ and $\langle 110 \rangle$ axis directions. These results are qualitatively consistent with the experimental ones that the Hugoniot-elastic limit along the $\langle 111 \rangle$ axis direction was larger than the others.

Tsutomu Mashimo
Kumamoto University

Date submitted: 07 Apr 2005

Electronic form version 1.4