Abstract Submitted
for the SHOCK19 Meeting of
The American Physical Society

Fast deformation of shocked quartz and implications for planar deformation features observed in shocked quartz. TOSHIMORI SEKINE, HPSTAR, TOMOKO SATO, Hiroshima Univ., NORIMASA OZAKI, KOHEI MIYANISHI, RYOSUKE KODAMA, Osaka Univ., YUSUKE SETO, Kobe Univ., YOSHINORI TANGE, JASRI, SUBODH TIWAN, AIICHIRO NAKANO, PRIYA VASHISHTA, Univ. South California — Planar deformation feature (PDF) sets observed in quartz provide an evidence for shock events. PDFs consist of the narrow, individual planar features of amorphous material, and their specific crystallographic orientations are related to a limited range of peak shock pressure. A comparison of PDFs observed in quartz between natural samples and experimental samples recovered at known conditions gives pressure estimation in natural shock events. However, the detailed mechanism is not fully understood yet, especially due to the fast formation process. We have tried to observe in time-resolved way by a direct diffraction method during shock compression and by a large scale molecular dynamics simulations. These results indicate that PDF formation, as well as planar fracture (PF) and rotation of crystallites, may occur during shock compression process even in elastic compression region. We need to know the changes during the release process in order to understand the shock effects in quartz.

Toshimori Sekine
HPSTAR

Date submitted: 27 Feb 2019 Electronic form version 1.4