Abstract Submitted for the SHOCK07 Meeting of The American Physical Society

The results of the application of Williamson-Hall procedure for analyses of diffraction maximum broadening of depleted unalloyed macrocrystalline uranium after shock-wave loading in range 20-50GPa ALEXAN-DER SHESTAKOV, EVGENY KOZLOV, IGOR ARTAMONOV, ALBERT NUR-GALEEV, IRINA PODGORNOVA, EKATERINA SHESTAKOVA, RFNC-VNIITF — Williamson-Hall procedure for investigation low symmetry lattice sample after shock-wave loading was applied. A number of depleted unalloyed macrocrystalline uranium disks (20mm in diameter, 3mm thick) were used in this testing. The samples under went three different impulse loads of 20GPa, 30GPa and 50GPa. During our registration these loading condition provided the high-speed uniaxial deformation in initial alpha-phase. The state of the preserved uranium samples differed not only in the amplitude and the width of impulse but also in the deformation value, shock heating and the degree of residual temperature. The influence on the samples led to changes in microstructure, including dislocation density which correlates with lattice microstrain. It was shown that the level of the lattice microstrain grew in comparison with its initial states but changed regularly according to the loading conditions. Reducing of uranium crystalline to fragments less then 100nm was not revealed.

> Alexander Shestakov RFNC-VNIITF

Date submitted: 22 Feb 2007

Electronic form version 1.4