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Recording of Dispersion of Elastic Wave Velocity in Natural Uranium ALEXEY FEDOROV, A.L. MIKHAILOV, A.V. MEN'SHIKH, S.A. FINYUSHIN, D.V. NAZAROV, V.A. DAVYDOV, T.A. GOVORUNOVA, E.V. FIL-INOV, N.A. YUKINA, A.A. KHOKHLOV, RFNC-VNIIEF, 607190, Sarov, Russia — Under shock-wave loading of planar samples of natural uranium, difference in time of elastic wave arrival to free surface was recorded by Fabry-Perot laser interferometer. This difference reached 100-250ns at sample thicknesses of 3-10 mm. In tests, the recorded value of longitudinal sound velocity is in the range from 3.26 to 3.6 km/s. Value of dispersion of longitudinal sound velocity was \sim 350 m/s (\sim 10%). In tests, dispersion of particle velocity was recorded at elastic precursor. It implies that different profiles and different amplitudes of elastic wave are recorded at different interferometric lines. Front of elastic wave in heterogeneous medium has complicated structure, which can be explained by shift and turning of structural elements of deformed medium at mesoscale. According to interferometric measurements, period of shear bands at elastic wave is 4-25 mm, and it is in good agreement with period of sliding lines recorded during microstructural analysis of recovered samples. At heterogeneous deformation of material, it is shown that plastic shears occur already at elastic precursor.

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