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Heterogeneous Deformation of Copper in Shock Waves at Subgrain Scale Level VIKTOR RAEVSKY, RFNC-VNIIEF — It is known that waves of sufficient intensity cause formation of periodic bands with increased strain intensity in metals. These bands are localized in separate grains, and they are located, as a rule, in parallel with each other. They have period of $\approx$10 μm, i.e. they differ from "classical" Luder's bands, which have mesolevel and are oriented in planes with the highest shear stress. Transition to heterogeneous regime of deformation in shock waves is accompanied with significant temporal reduction of shear strength of substance (approximately 2-3 times). It should be taken into account when developing models of high-rate strain. At the same time, conditions of formation of heterogeneous structures and the dependences of the loading process have been poorly studied. Also there are no data on substance structure inside bands of localized deformation. The paper presents results of new experimental and numerical-theoretical studies of heterogeneous regime of deformation in copper, which were performed in 2003 – 2004 in RFNC-VNIIEF. The paper includes results of studies of formation of heterogeneous structures at mesolevel under shock-wave and shockless high-rate loading for monocrystals of copper and polycrystal copper with various grain sizes.

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