

Abstract Submitted
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Turbulent Pulsations as a Way for Dynamic Straining of Solids¹

YURY MESHCHERYAKOV, Institute for problems of mechanical engineering RAS, PHYSICS FRACTURE LAB. TEAM — Although dislocations and twins are known to be the basic deformation mechanisms in solids, they cannot provide a direct coupling between micro- and macroscales of dynamic straining. Necessary intermediate mechanisms are the mesoscale turbulent pulsations and vortical structures which result from shock-induced structure instability of solids and are the main mechanisms of momentum and energy transportation. These mechanisms may be reversible or irreversible depending on the ratio of local (mesoscale) and macroscopic strain rates. The quantitative measures of transported energy are the particle velocity dispersion and velocity defect. In the paper presented, the different situations of meso-macro energy exchange are analyzed on the basis of series of shock experiments where the particle velocity dispersion and particle velocity defect are measured in real time.

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