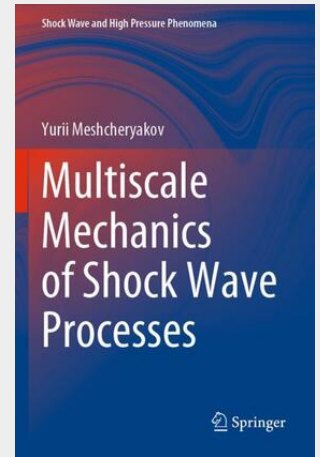


Multiscale Mechanics of Shock Wave Processes

This book presents theoretical and experimental investigations of mechanical behavior of solids under shock loading and highlights a multi-scale exchange process of energy and momentum between meso and macroscopic hierarchy. It also widely covers experimental approaches for the multi-scale response of solids to impacts including uniaxial strain conditions and high-velocity penetration processes. The content comprises two parts. The first part overviews modeling and theory of dynamically deformed solids from the multi-scale point of view. The second part describes experimental characterization of shock-induced solids and experimental probing of mesostructured and mesoscale dynamic processes in solids. The theory presented in the first part is then verified as it is compared with i) experiments of shock loading into different kinds of solids and ii) probed microstructure of post-shocked specimens by scanning electron microscopy, transmission electron microscopy and optical microscopy. The text is written on the basis of author's lectures at universities and thus is concisely described for postgraduate students. It is also useful for researchers who work on the theory of multi-scale mechanics of solids and engineers who work on testing materials under dynamic loading.

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