

APPLICATION OF PERTURBATION METHOD TO DETERMINE ELASTIC-PLASTIC PROPERTIES OF MATTER

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The dynamic perturbation method is used to build and validate strength models of matter [1–2]. To implement this method, periodic (or local) perturbations are specified on the surface of the tested sample. The sample is then subjected to shock-wave loading. The evolution of perturbations is conventionally recorded using radiographic, protonographic, and streak photography methods [3]. The experimental data described by numerical calculations are compared with a strength model [4] for their calibration.

In the work, the PDV method was tested in recording evolution of perturbations in steel and copper samples. Such experimental setup allowed significantly increasing the volume of experimental data. The capability of PDV method to resolve the effect of artificially specified perturbations on dynamics of the sample surface was demonstrated. The presented analysis of the experimental data and theoretical and computational results obtained using the methods in [5–6] show essential agreement.

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