

Numerical solution of inverse problem to determine parameters of non-stationary load from measured parameters of shell reaction

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The implementation of modern technical requirements for missile and space technics is impossible without ensuring the protection of their constructions from the mechanical action of radiation and the impact of compact solids. Both types of actions cause non-stationary deformations of constructions and their subsequent destruction. In the case when the construction is protected by a multi-layer porous package, the wave stage of deformation is generally not dangerous and destruction occurs at the shell stage. At the same time, the features of the mechanical action of radiation and the impact of bodies are leveled, and as a result, everything is reduced to the effect of one-sided non-stationary pressure on the surface of the protected construction.

This work is devoted to the determination of pressure parameters (its impulse and duration) from the measured reaction parameters of the thin-walled construction (non-stationary deflections and deformation fields). The solution of this inverse problem was made numerically using regularization methods and the results of multivariable calculations of non-stationary deformations and deflections of multilayer panels and cylindrical shells according to the method [1]. This work was supported by the RFBR (19-08-00606-a).

[1] Bakulin V and Ostrik A 2015 *Complex action of radiations and particles on the thin-walled constructions having heterogeneous coverings* (M: FML)