

Calculation of the invariant characteristics of forced oscillations of a beam with longitudinal compression and its phenomenological model

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In the course of a full-scale experiment with an elastic beam with longitudinal compression a large set of data was obtained. This sets contain values corresponding to both ordered oscillations and disordered oscillations specific to dynamical systems with chaotic behavior. The oscillations are excited by the exposure of alternating magnetic field. Depending on the frequency of the harmonic action the laws of motion of the beam were registered.

As a result of numerical experiments, the correlation dimension and the β -statenropy of the attractor of the corresponding dynamical system were calculated. Pseudo-phase portraits of the attractor were also constructed.

Based on the received characteristics, a phenomenological model was proposed. On the basis of a comparison of the invariant characteristics of the model and experimental data, one can draw a conclusion about the adequacy of the chosen model.

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