EuroSciCon

International Conference on
Metal, Mining and Magnetic Materials

November 01-02, 2018
Paris, France

J Mat. Sci. 2018, Volume:6
DOI: 10.4172/2321-6212-C7-033

# STRUCTURAL-PARAMETRIC MODEL OF ELECTROMAGNETOELASTIC ACTUATOR FOR NANOTECHNOLOGY

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**At present the electromagnetoelastic actuators based on the electromagnetoelasticity with piezoelectric, magnetostriction, piezomagnetic, electrostriction effects are used in the nanonotechnology, the nanobiology, the nanomechanics, the microelectronics, the adaptive optics and the laser systems. The piezoactuator is the piezomechanical device intended for the actuation of the mechanisms, the systems or the management based on the piezoelectric effect, converts the electrical signals into the mechanical movement and the force. The piezoactuator for the nanonotechnology is used in the scanning tunneling microscopes, the scanning force microscopes and the atomic force microscopes. Using the solutions of the equation of the electromagnetoelasticity of the wave equation and the matrix equation of the electromagnetoelastic actuator with the Laplace transform and taking into account the features of the deformations along the coordinate axes, it is possible to construct the generalized structural-parametric model of the actuator and to describe its dynamic and static properties. Effects of geometric and physical parameters of electromagnetoelastic actuator and external load on its dynamic characteristics are determined. Structural-parametric model, decision wave equation and matrix equations of electromagnetoelastic actuator are obtained; its transfer functions are built. The static and dynamic characteristics of the piezoactuator are determined. For calculation of the control system for the nanometric movement, the generalized parametric structural schematic diagram and the transfer functions of the electromagnetoelastic actuator are obtained. The transfer functions and the parametric structural schematic diagram of the piezoactuator for the transverse, longitudinal, shift piezoelectric effects are obtained from the structural-parametric model of the piezoactuator. The generalized structural-parametric model of the electromagnetoelastic actuator provides the determination of its transfer functions and uses the methods of the control theory for the static and dynamic characteristics of the electromagnetoelastic actuator for nanotechnology. From generalized structural-parametric model of the electromagnetoelastic actuator after algebraic transformations, we obtained the matrix transfer functions of the actuator.**

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