

## **On the problem of simulating kinematics and dynamics of controllable systems with software links**

© O.V. Matukhina

Nizhnekamsk Institute for Chemical Technology,  
Branch of the FSBEI HPE Kazan National Research Technological University,  
Nizhnekamsk, 423570, Russia

*The article discusses mathematical simulation of kinematic properties and control of dynamics of systems with software links. The construction of differential equation systems used for generation of nonstationary differential link equations is proposed. The problem of generating equations of dynamics based on the integral variational principle is considered. To solve the problem of link stabilization the equations of software links are introduced into consideration. The application of the described simulation methods is shown on the example of the problem of controlling the wheel system movement with moving obstacles bypassing. In the course of solving, system kinematics equations are generated, expressed in the form of equations of nonstationary differential links. A model of the system dynamics with software links is constructed. Expressions for control forces affecting the system are determined to ensure the fulfillment of the link equations governing the system. The results of solving this problem illustrate the effectiveness of the described methods. The methods proposed in the work are applicable for solving trajectory problems, tasks of controlling electromechanical system movement, tasks of controlling the dynamics of economic, production and technical systems.*

**Keywords:** *controlling the dynamics, stability, stabilization, software links*

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**Matukhina O.V.**, Cand. Sc. (Phys. & Math.), Associate Professor, Department of Information Systems and Technologies, Nizhnekamsk Institute for Chemical Technology, Branch of the FSBEI HPE Kazan National Research Technological University. Research interests: information technology, mathematical modeling, numerical methods, differential equations, control theory, theoretical and analytical mechanics.  
e-mail: ovmatukhina@gmail.com