

Development of analysis methods, evaluation and optimal control for nonlinear unmeasured dynamic systems in uncertain conditions

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There are got principally new methods of analysis of managed systems in unmeasured spaces and methods of mixed systems analysis. There are explored the conditions of solvability, and functional analytical properties of significant decision operator of the systems of nonlinear operator and differentially operator equations in Banach spaces, and also of variative inequations of parabolic type and evolutionary including are learned.

There is opened system research of comparatively new mathematical object, namely, differential including in parts derivative. For this class of objects, there are generalized the Brezis method of singular indignations, method of Galiorokynsky approximations and method of decimal approximations. We use substantially our previous research on generalization of Ki Fan inequalities for the class of mass upper semi continuous reflections in topological spaces with compact values.

There are also developed the methods of research of dynamics of nonlinear unmeasured systems, initial state of which does not synonymously determine their further behavior. Nonlinear evolutionary equations in parts derivative without unique solution, differential inclusions in parts derivative, evolutionary variation inequalities and others like that belong to them.

For the first time, there are carried out system researches of optimization problems for mixed systems, meaning systems described with mathematical models of different types (with distributed and concentrated parameters, differential and integral equations, etc).

The method proposed will be used for development of algorithms of process control in metallurgy, chemical technology, and ecology, and also at construction of theory of extreme solutions for nonlinear singular distributed systems.