

Alevtina Keller
South Ural State University

Algorithms for the Numerical Solution of Optimal Control Problems for Models of the Leontief Type

The report provides an overview of results of a numerical research of the class of problems that is considered by the example of optimal control, hard control, start control and hard starting control for the Leontief type systems. Such systems arise in modelling of different processes and objects, for example measuring transducers, economic systems of an enterprise, and dynamics of a cell cycle. Leontief type system is a finite-dimensional analogue of the Sobolev type equation therefore our research is based on the methods of the theory of degenerate groups of operators. The report presents an algorithm for finding of approximate solutions to a variety of optimal control problems for Leontief type systems with the Showalter–Sidorov initial condition which is more convenient in numerical research. The proof of the convergence of the approximate solutions to the precise one is an important result. The issues of improving of the efficiency of numerical algorithms and their modifications in the numerical study of applications are discussed. Special attention is given to the numerical algorithms for solving of the optimal measurement problems which are the problems of restoration of signals dynamically distorted both by inertia of the measuring device, and resonances in its circuits. The results of computational experiments are presented.