

Development of mathematical models and algorithms of flows control in networks with different conservation laws

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There are explored the problems of flow design in networks which satisfy different conservation laws: the classic and generalized Kirghoff laws. Such problems appear in the process of distribution of water flows in channels of irrigator systems, or in the process of gas transporting in main pipelines. The main purpose is construction of new models of motion of flows in networks, and development of new algorithms of finding optimum flows on the basis of linear and nonlinear optimization methods and methods of variables exclusion.

Practical value of future results is caused by possibility of using conceptual approaches, models, methods and algorithms by scientific research and project design organizations at development of resource saving technologies and eco-saving measures in the process of hydro- and gas supplying system planning and at the development of sensor based systems and processes of operative management by irrigation and gas distribution.

The way given is used for development of resource saving technologies and eco-saving measures in the process of hydro- and gas-supplying system planning, in particular, in the Institute of Hydraulic Engineering and Land Reclamation of Academy of Agrarian Sciences of Ukraine.