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The predictive control principle and perspectives of its application in automatic control systems

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Instead of the standard control principle on current state of control output, it is offered to pass to the predictive control principle on future output. It is shown that realization of this principle in automatic control systems of technological parameters with standard algorithms (P, PI, PID) allows to increase significantly quality of regulation and at the same time more fully to use the opportunities given by programmable microprocessor equipment. The examples given in the paper are proving that the forecast allows to reduce the range of control output deviation in one-circuit systems twice, and in double-circuit systems — three times. Prediction can be used in coherent systems of regulation for the best approach of the real influence compensator to the ideal compensator. Potential opportunities of predictive algorithms can be used at setup of regulators on the operating object for cases when its dynamic characteristics are unknown. The method of setup of predictive linear regulators by one parameter — forecast time — is offered. Possibilities of such control are supported with results of modeling tests.

Biography

Pikina Galina Alekseevna is a Doctor of Technical Sciences and Professor at Russia National Research University "MPEI" Moscow. He is an author of more than 150 publications, including text-books and two monographs. He has 45 years of working experience in the university education. His fields of interests are modeling, optimal control, identification, and statistics.

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