New mathematical methods for analyzing telemetric information in spacecraft flight control

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The article considers mathematical methods for solving problems of spacecraft flight control. A review of existing methods for analyzing telemetric information used in flight control of domestic spacecrafts is carried out. The stages of processing the analysis of telemetric information are studied, the place of the proposed mathematical methods in the control system is determined. The urgency and possibility of intellectualization of methods for solving problems of monitoring the state of the spacecraft when controlling the flight are substantiated. Methods for automation of control processes based on a special mathematical apparatus are proposed. A brief mathematical description of the proposed methods for signal analysis is given. Mathematical methods for the telemetric information analysis are offered and their main advantages are indicated. Particular attention is paid to wavelet transform of signals as the most universal of the proposed methods. The basic principles of using wavelet analysis for solving problems of monitoring and forecasting the spacecraft state are outlined.

Keywords: *spacecraft, flight control, monitoring, telemetric information, automation, wavelet transform, state analysis*

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