Features of using Kalman filter for algorithmic compensation of inertial navigation system errors

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Algorithmic error compensation is the main method for improving the accuracy of inertial navigation systems (INS). Its implementation requires the synthesis of estimation algorithms, which includes the formation of a model of the estimated dynamic system state vector. The type and order of the model determine the accuracy and quality of the estimates obtained as a result of filtering. The study proposes the concurrent use of several different models, for each of them its own estimation algorithm is synthesized, which is the most adequate to the transport motion mode. The real data for the system installed on the helicopter show the advantages of such computational scheme. We also suggest introducing the adaptive tuning into the filtering algorithm, which will increase the accuracy of the estimates and improve the quality of transients of estimates convergence. A specific example shows the positive effect of such adaptive tuning introduced into the algorithm.

Keywords**:** *inertial navigation system (INS), global navigation satellite system (GNSS), dynamic system state vector, Kalman filter, masterfilter*

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