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NON-COOPERATIVE OBJECT PARAMETER DETERMINATIN IN ORBITAL SERVICE TASKS

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The solution of orbital service system motion problems calls for considering the features of service object parameter measurement data processing. A service object is usually non-cooperative, if not with unknown characteristics. The goal of this work is to systematize the results of research into the processing of measurement data on the parameters of non-cooperative space objects. This paper analyzes available methods for orbital remote determination of space object parameters and motion. The key components of the methods considered are set off: direct-measurement data preprocessing, the choice of models of object center-of-mass and about-the-center-of-mass motion, and object parameter and motion estimation based on the results of the preprocessing and the adopted dynamics models. Modern methods for orbital remote determination of object parameters mainly use range imaging data. The output of the measurement data preprocessing (surrogate processing) is, as a rule, the positions of the so-called geometric center of the object and the body frame axes. In choosing the service object motion model, the orbital motion of the servicing spacecraft and the service object is for the most part neglected. At the same time, there is a tendency to the consideration of orbital motion in further studies. Among the methods of orbital service object parameter estimation, methods based on various modifications of the Kalman filter have seen the greatest use. Other estimation methods are used too. At present, the concentration of the developers of the methods considered is placed on improving the object parameter estimation accuracy and shortening the computation time. The analysis of the methods for orbital remote determination of service object characteristics presented in this paper may be used in simulating the motion of a servicing spacecraft and a service object and in estimating the characteristics of the measurement data processing procedure.

Keywords: *orbital service, non-cooperative object, object parameters, motion parameters, remote determination*

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