
Optimization of calculation algorithm for models developed with a method based on three-stage decomposition

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The article considers the development of service systems computer models on board the spacecraft. We describe existing approaches to computer modeling, their features for such technical systems; propose a new approach which, firstly, allows us to consider the various physical interactions that occur in the system, secondly, to structure the model and, thirdly, to present it as a uniform element set. The study suggests the algorithm that makes it possible to build a software representation of the state vector and propose settlement functions of the system under study, based on a formal description of its model, made in accordance with the described approach to modeling. On the base of the algorithm we developed a computer program. The study estimates the computer program speed and the possibility of using an original approach to modeling service systems on board the spacecraft in order to inform spacecraft flight control and describes the measures to further performance improving.

Keywords: computer modeling, simulation, modeling language, spacecraft thermal control system, three-stage decomposition, customizable model.

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