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Problem-oriented system for spacecraft designing

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While spacecraft designing, initially there may exist a couple of various design variants and the project may be updated many times. At that, it is necessary to check the impact of altered design parameters on the spacecraft target characteristics and mutual influence of all the changes. The spacecraft is characterized by quite a few parameters linked by a great number of equations. So, it is not always clear whether the design task is correct and tractable, and what the sequence of its solving is. In order to help to design engineers, a Problem-Oriented Designing System (PODS) can be developed. The process of setting and solving of design problems with the help of PODS includes: Assignment of the parameters and equations which describe the spacecraft and its systems, design problem setting, determination of the problem correctness, indicating of equations sets from which every desired variable can be derived, breaking of the original equations system into subsystems which have to be solved jointly, determination of the sequence of the equations system solving and determination of desired variables numerical values. The methodology of PODS engineering is based on the graph theory and the theory of relations. It was implemented in bundled software, developed in Java programming language. The software was tested in several AS systems.

Biography

Alexander S Kucherov has completed his PhD from Samara State Aerospace University. He is the Head of Academic Division and Associate Professor of Space Engineering Department. He has published more than 60 papers including 12 papers in reputed journals.

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