

IAF SPACE SYSTEMS SYMPOSIUM (D1)
Interactive Presentations - IAF SPACE SYSTEMS SYMPOSIUM (IP)

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SOFTWARE PACKAGE DESIGN FOR PARTIAL AUTOMATIZATION OF THE DESIGN PROCESS
OF RE-ENTRY INTERPLANETARY MODULES

Abstract

Design tasks of advanced re-entry interplanetary modules and landing vehicles are prone to the problem related with the necessity of integrated multiple criteria analysis of large amounts of various data and reaching a compromise between various parameters of a system being designed, technological capabilities of vendors, and economic considerations. With the present-day technology of computers, by using special software, a partial automatization can be achieved in the service operation, analysis and matching of large amounts of data and alternative variants, which in turn, already at early design phases, enables one to find, on an integrated basis, with sufficiently high detalization, accuracy and reliability, the most rational parameters of both the re-entry modulus in the whole and of its separate subsystems.

We present the results of the first stage of a project aimed at the development of an instrument implemented as a software package and which is capable of partially automating the processing of large amounts on alternative variants of landing vehicles design.

At the first stage, landing vehicles are considered in the axially-symmetrical composition. This representation encompasses, without major simplifications, ballistic and glide re-entry vehicles (for example, Soyuz or Appolo type vehicles) and, in the first approximation, lifting body vehicles (like the Clipper vehicle).

Special emphasis is paid on the vehicle's heat protection, because high thermal loads acting on a landing module impose considerable restrictions on the choice by the designer of the vehicle geometry, types and characteristics of actuators of the control and landing systems, and hence, the vehicle capabilities.