

Substructure Method for Thermal-Stress Analysis of Liquid-Propellant Rocket Engine Combustion Chamber

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Abstract : This article is devoted to an important problem of calculation of deflected mode of the combustion chamber and the nozzle end of a new liquid-propellant rocket cruise engine. A special attention is given to the methodology of calculation. Three operating modes are considered. The analysis has been conducted in ANSYS software. The methods of conducted research are mathematical modelling, substructure method, cyclic symmetry, and finite element method. The calculation has been carried out to order of S. P. Korolev Rocket and Space Corporation «Energia». The main results are practical. Proposed methodology and created models would be able to use for a wide range of strength problems.

Keywords : combustion chamber, cyclic symmetry, finite element method, liquid-propellant rocket engine, nozzle end, substructure

Conference Title : ICAMAME 2014 : International Conference on Aerospace, Mechanical, Automotive and Materials Engineering

Conference Location : Paris, France

Conference Dates : April 28-29, 2014