Paper ID: 10803
student

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Small Launchers: concepts and operations (7)

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STEERING MECHANISM FOR THE NERVA ORBITAL SECOND STAGE

Abstract

NERVA small space launcher under development in Romania by a consortium under coordination from Politehnica University is based on the solution of hard take-off with three strep-on SRM boosters and a high lifting second stage. The second stage is responsible for achieving the orbital altitude almost from the ground and a remainder half of the orbital velocity. The main development effort is directed towards the implementation of the exo-atmospheric steering mechanism, based on small gimballed thrusters. The development phase of the steering motors is presented with emphasis on the design technology and propulsion performance. Guidance constraints regarding the accuracy and unsteady response of the gasdynamic steering are developed and analysed. Test stand proofs are analysed. The flight experiment with the thrust measuring system is presented and results are interpreted for further development of the NERVA space carrier.