

SPACE PROPULSION SYMPOSIUM (C4)  
Propulsion Systems I (1)

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INVESTIGATION OF CHARACTERISTICS OF THE VEGA LV FOURTH STAGE MAIN ENGINE  
ASSEMBLY: LOW-FREQUENCY OSCILLATIONS STABILITY, LATERAL DISTURBANCES AT  
STARTUP

**Abstract**

The Yuzhnoye SDO is completing work on creation of the Main Engine Assembly (MEA) for the European LV Vega fourth stage under contract with Avio Company, Italy. Materials on performed qualification tests are submitted to the ESA review group. The completed qualification tests program was supplemented with additional fire tests investigations: determination of the MEA transfer function as a dynamic link of the control system and confirmation of MEA low-frequency stability during tests with generators of sinusoidal inlet pressure oscillations; measurement of lateral forces acting on combustion chamber elements during startup and in the steady-state mode; confirmation of restarts stability. The results of additional fire tests have confirmed dynamic compatibility of the system MEA + LV stage. This allows confident prediction of propulsion system stable operation.