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THE MODAL TEST OF THE CZ-2F STRAP-ON LAUNCH VEHICLE

Abstract

The CZ-2F launch vehicles were used to launch the SHENZHOU spacecraft. The compound dynamic characteristics of the spacecraft and the vehicle were the basis of the design of the attitude control system and POGO, so the dynamic characteristics test for the compound of the spacecraft and the vehicle was needed to carry out. The modes of the strap-on launch vehicle were characterized by the 3-D space in which the lateral modes, the longitudinal modes and the torsion modes were coupled together. In this paper, the design of the modal test with the 3-D modes viewpoints was described, and the testing procedure which includes the supporting suspension of the vehicle, the fuel fill simulation, the configuration of the test instruments, the shake and the measurement method, and the curving fit method of the modal parameters was described. The test results and their analysis were proposed, which demonstrates the 3-D modal characters of the strap-on launch vehicle. Finally, the modes which are important in the POGO design of the strap-on launch vehicle are pointed out.