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EXPERIMENTAL RESEARCH ON SIMULATION OF ROCKETS TAKEOFF

**Abstract**

Due to need of purging operation, propellant replenishing, pressurization and hold-down and release mechanism, the reliability of cryogenic rockets has much higher requirement since more systems and equipment are involved in the takeoff of rockets and have influence on the performance of the rockets in the process. Meanwhile, the impact on those system and equipment are also direct in the takeoff. Thus the experiment has to be carried out for the reliability and safety in the rocket takeoff, and the experimental equipment has to be developed to simulate the complex relation of relevant system. Take off acceleration, drift magnitude, vibration, noise, heat and aerodynamic conditions are the key parameters concerned in the takeoff of rockets. The experiments do focus on the influence of acceleration, drift magnitude, vibration on relevant systems. In these experiments, the rockets can take off up or support-stand move down, and the equipment are driven by hydraulic power, pneumatic power, gravity or electronic power. In this paper, different experimental solutions are analyzed and compared. More discussions are put on the experiments on simulation of the rocket take-off upward which driven by the gravity, and the treatment how to make the experimental condition correspond to the practical condition.