

SPACE PROPULSION SYMPOSIUM (C4)  
Hypersonic and Combined Cycle Propulsion (9)

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## A PARALLEL DIRECT-CONNECT TEST SYSTEM FOR SOLID DUCTED ROCKET

**Abstract**

The direct-connect test of ramjet is the most commonly used means to study the combustion laws of combustor and to optimize the combustor structure. In order to reduce the effect of deviation between different tests on the tests results, a new parallel direct-connect test scheme for solid ducted rocket (SDR) was proposed. The parallel test system of SDR were designed based on modularization design method, and the direct-connect tests were performed to verify the feasibility of the parallel test system. Then the parallel test system of SDR was used to study the effect of combustor structural parameters on the combustion characteristics of SDR. The researching results indicate that the designed parallel test system of SDR can mainly eliminate the deviation of fuel rich gas, air flow and other factors between the two parallel comparison combustors, which provide a useful reference for ground test of ramjet. Using the parallel test system, the comparative analysis can be carried out to discuss how different ramjet combustor structure parameters affect the combustion performance. It is concluded that the parallel direct-connect test system of SDR will provide guidance for combustion performance evaluation and structure optimization design of ramjet.