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THE ARC-HEATED DIRECT-CONNECTED TESTING TECHNOLOGY OF SCRAMJET COMBUSTOR THERMAL PROTECTION SYSTEM

Abstract

Based on the original arc-heater direct-connected scramjet combustor working performance test facility, a new method, which is used to test the long-time thermal protection performance of the active and passive scramjet combustor thermal protection system (TPS), has been developed. According to the active scramjet combustor test demand, the fuel supply and control system has been improved, which can steadily supply fuel when the exit pressure is increasing. The temperature distributing of the scramjet exterior wall has been measured by the B-type thermocouples, which have been installed by the heat-insulation felt and high-temperature alloy steel ring. The axial deformation of the scramjet has been gained by the axial-free supports and displacement sensors. With the three parts improvement, the arc-heater direct-connected testing technology of the scramjet combustor TPS thermal protection performance can last for thousand seconds. And a mass of the scramjet combustor thermal protection performance data in the normal work situation, such as the fuel flux, the exterior wall temperature distributing and the axial deformation, has been obtained for long time.