

SPACE PROPULSION SYMPOSIUM (C4)
Hypersonic and Combined Cycle Propulsion (5)

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SUBASSEMBLY MATCHING RESEARCH AND SYSTEM DEMONSTRATION TESTS OF AIR
TURBO ROCKET**Abstract**

The overall performance on air turbo rocket/ramjet (ATR) has been computed based on the effect analysis of subassembly parameter on specific impulse and thrust of the engine, the optimization principles of subassembly parameters in different sortie target is given, include the effect trend between the subassembly character and the general performance of ATR. This paper also gives the performance on different altitude and velocity condition on ATR with the liquid oxygen and hydrocarbon propellants in detail, it is shown that the ATR possesses high specific impulse(10000 Ns/kg), and the performance varies about 10 percent in the working range. This result indicates that ATR could be used as the propulsion system of near space vehicles, and the hot firing test results of a demonstration engine are also presented. Then the key component form, characteristic, application advantages and disadvantages are also analyzed in depth. Finally, the key component schemes which adapt to ATR are given, the research result would provide available instructions on the further development of ATR.