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

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COMBINED CYCLE PROPULSION SYSTEM?CHALLENGE AND PROSPECTS

Abstract

Various propulsion systems have different advantages and flight airspace, such as aero engine, ramjet, rocket motor and piston engine. Combined cycle propulsion system will be the best combination of efficiency and economy, because it can absorb these advantages.

Some problems and critical technologies which needs to be considered and settled are pointed outCombined cycle propulsion applications to reusable TSTO space transportationnearby space or space planeand SSTO vehicle are discussedThen the research status of combined cycle propulsion system in China are presented. Experience, lessons and difficulties during the development of RBCC propulsion system are analyzed. It shows that the pylon with cavity improves the combustion stabilizationand it provides robust combustion efficiency and wide operability liquid hydrocarbon

TBCC is expected to be the most possible power choice for first stage of the two-stage-to-orbit vehicle and would have a bright future for high speed airplane and cruise missile. RBCC would mostly be used as power system of high-velocity aircraft in near space altitude. ATR is expected to be used as first power of orbital vehicle.

Based on study of the principle and critical technology, suggestion about combined cycle propulsion development is put forward