

SPACE PROPULSION SYMPOSIUM (C4)
Propulsion Technology (3)

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RESEARCH ON THE RADIAL TURBINE USED IN THE LOX/HYDROGEN ROCKET ENGINE

Abstract

Turbopump is the key part of a LOX/LH2 rocket engine. By using a turbine to drive the pump, turbopump supplies hydrogen and oxygen to an engine at the required pressure. Nowadays, the LOX/LH2 rocket engines in service all around the world adopt axial turbine with no exception. Whatsoever, the turbine using in LOX/LH2 rocket engine has a small flux. Thus, based on theoretical analysis, adopting radial turbine can be a good idea. Recently, a radial turbine has been adopted in the development of a LOX/LH2 rocket engine. At present, several hot tests of the engine has been done. The results indicate the engine works reliably with satisfied acceleration time during start transient and turbine efficiency. In this paper, some key problems on applying radial turbine to LOX/LH2 rocket engine, such as axial force, disk strength, turbine efficiency, and etc, are summarized and then solved by means of theoretial analysis, numerical simulation, and experiments. Moreover, the difference between radial and axial turbine applying to LOX/LH2 rocket engine is compared and summarized.