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

Author: Dr. Yi Li
China Academy of Launch Vehicle Technology(CALT), China, yilimm@gmail.com

THE SUPERSONIC WAVERIDER AERODYNAMIC CONFIGURATION WITH ROCKET BASED COMBINED CYCLE(RBCC)ENGINE AERODYNAMIC/PROPULSION INTEGRATION

Abstract

The research is a about the supersonic waverider aerodynamic configuration with Rocket Based Combined Cycle(RBCC) engine aerodynamic/propulsion integral technology. Based on good waverider aerodynamic characteristics such as low drag coefficient, high lift coefficient and high lift/drag coefficient, it considers RBCC engine need and control and try to avoid that the RBCC engine can't work normally or avoid deviating the advantages because of the RBCC engine off the design condition. RBCC supersonic waverider aircraft aerodynamic/propulsion integral design technology research focuses on the aerodynamic configuration/propulsion integral technology based on the supersonic waverider aerodynamic configuration/propulsion integral technology characteristics, every part of the aircraft is divided into two groups, one are the aerodynamic parts, the other are the propulsion parts, then do simulation analysis. Secondly, we conduct the supersonic waverider aircraft front part and the inlet integrated design, the back part and the spray tube integrated design, the RBCC engine work condition influence for the integrated aerodynamic characteristics, and the RBCC work condition influence for the aircraft stability and vehicle trim characteristics. Lastly, we conduct supersonic waverider aircraft aerodynamic propulsion geometry parameter model method research and building up related process. During the RBCC supersonic waverider aircraft aerodynamic/propulsion integrated research, the aerodynamic characteristics of the vehicle should be indicated and analyzed.