

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

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INVESTIGATION OF THE METHOD OF IMPROVING ISOLATOR PERFORMANCE

**Abstract**

Dual Mode Ramjet engine that can work at the wide range Mach number could be the propulsion system of the next generation space launcher, which will decrease the launch cost greatly. Fixed geometry configuration flowpath can decrease weight and increase reliability of the Dual Mode Ramjet engine. In order to keep inlet start, combustor pressure must be low which induce dual mode ramjet thrust small at the low flight mach number. Improving the performance of dual mode ramjet at the low flight mach number is important to the high accelerating requirement. Considering low performance at low flight Mach Number, a concept was brought out that increasing isolator back pressure resistibility with the assistant of high speed flow generated by main rocket which will improve dual mode ramjet thrust performance. Experimental results show that the advantage disappears when main rocket pressure ratio exceeds the minimum limit and main rocket exhaust makes isolator unstart when main rocket pressure ratio exceeds the maximum limit. The maximum isolator pressure ratio linearly depends on main rocket pressure ratio when main rocket pressure ratio locates between the maximum limit and minimum limit.