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عنوان مقاله:

Aerothermodynamic Off-Design Performance Study of a Fixed Double Bypass Duct Turbofan Engine

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خلاصه مقاله:

In this paper, a turbofan engine with double bypass duct (DBP) was studied at design point and off-design conditions. This engine is a separate exhaust, two spool turbofan engine with bleed, turbine cooling, power extraction, and convergent exhaust nozzles. Bypass ratio of main and secondary duct is equal one. Also, a typical turbofan engine with one bypass duct is considered as the benchmark case (simple engine) and its bypass ratio is ۲. Simulation results show that DBP engine produces ۵.۴% thrust more than the simple engine at M=۰.۸ and altitude of ۹۲۹۶.۴ m (design point). DBP engine thrust is more than the simple engine at SL altitude and ۹۲۹۶.۴ m at off-design conditions in all flight Mach numbers ranging from ۰ to ۰.۸. Moreover, the double bypass duct engine SFC is lower than the simple engine at prementioned off-design conditions. Thrust per mass flow rate (F/m) was also studied. By increasing F/m , specific fuel consumption is decreased for both engine types. Another interesting finding is that at constant F/m , DBP engine SFC is lower than simple engine at all flight altitudes.

کلمات کلیدی:

turbofan engine, double bypass duct, off-design, thrust, specific fuel consumption

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