الآية

﴿ وَاضْرِبْ لَهُمْ مَثَلَ الْحَيَاةِ الدُّنْيَا كَمَاءٍ أَنْزَلْنَاهُ مِنَ السَّمَاءِ فَاخْتَلَطَ بِهِ نَبَاتُ الْأَرْضِ فَأَصْبَحَ هَشِيمًا تَذْرُوهُ الرِّيَاحُ ۗ وَكَانَ اللَّهُ عَلَىٰ كُلِّ شَيْءٍ مُقْتَدِرًا ﴾

الكهف الآية ﴿٤٥﴾

الإهداء

نهدي العمل لآبائنا و أمهاتنا

****

للأستاذة بقسم هندسة الطيران

****

إلي كل من علمنا حرفاً

شكر و تقدير

أولاً نشكر عز و جل الذي سخر لنا هذا العمل بفضله ومنّه ، و أيضا الشكر موصول للأستاذ الفاتح مكي معروف الذي أشرف على هذا العمل بدعمه و نصائحه المتواصلة وعلى معاملته الكريمة ، و أيضا الشكر إلي كل من ساهم برأيه في إخراج هذا العمل من زملائنا بالدفعة ١٣ طيران ، وكل الشكر مع خالص الحب لأسرنا الكريمة و هي ترعى و تدعم بصبر بالغ ، سائلين الله عز و جل أن يجزيهم جميعهم خيراً و يجعل ذلك في ميزان حسناتهم . ..... والله والموفق

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Symbol	Quantity
OPR	Overall pressure ratio
BPR	Bypass ratio
ST	Specific thrust
ήfan	Fan polytrophic efficiency
ήLPC	Low-pressure compressor efficiency
ήHPC	High- pressure compressor efficiency
ήHPT	High-pressure turbine polytropic efficiency
ήLPT	low- pressure turbine polytropic efficiency
Tt4	Turbine inlet temperature
Пd	Inlet pressure recovery
Пb	Combustor pressure ratio
Пnc	Core nozzle pressure ratio
Пnb	Bypass nozzle pressure ratio
FPR	Fan pressure ratio

$(Arec)$	The total rectangular area occupied by the fans
Df	Fan diameter
Nf	Fan numbers
$A1$	Propulsion system inlet
$A2$	Fan inlet
$Amix$	Mixer nozzle inlet
ω2 max	Maximum span wise extent
CD	Discharge coefficient
Cfg	Gross Thrust coefficient
C	Speed of sound
D	Diameter (m2)
Vj	Jet speed [m/s]
W	Acoustic power [w]
ρ	Density [$Kg\ m^{-3}$]

$\dot{m}$	Mass flow rate [$Kg\ s^{-1}$]
A	Jet area [m2]
̓H	Polytropic efficiency[9]
γ	Ratio of specific thrust
T	Temperature [K]
R	Gas constant [J Kg K]
γ	Ratio of specific thrust
Vo	Flight speed [m/s]
M	Mach number

Abbreviations:

ENPL : Effective perceived noise level

BWB : Blended wing body

ST : Specific thrust

TSFC : Thrust specific fuel consumption

VAN : Variable area nozzle

Abstract

noise emitted by commercial aircraft has been one of the most critical environmental issue , such as large number of people effected by aviation noise .The International body ICAO sets the common rules for the level of noise & engine emission through Annex 16 to the Chicago Convention 1944.

Since the Most of aircraft noise is emitted by propulsion system, the major objective of this project is to review, study and optimisation of the recently techniques of design , that can achieve the concept of silent propulsion system (30 dB noise reduction).

Ultra high bypass ratio engines with the influence of fan pressure ratio on engine noise emission , in addition to the concept of distributed propulsion system with high aspect ratio nozzle are two basic branches of this project.

A300-600 powered by trent 500 was taken as case study for optimization the effet of fan pressure ratio on jet velocity as well as on jet noise emissions under normal takeoff flight conditions .Another case study was carried out for optimization the Influence of high aspect ratio nozzle on jet noise emissions .

The fan pressure ratio was adjusted , and the optimum jet area was estimiated for (30 EPNL dB) reduction which can achieve the concept for silent propulsion system.