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# High bypass turbofan engine and anti-icing system performance: Mass flow rate of Anti-icing bleed air system effect

- **ملخص البحث (الرابع) باللغة الإنجليزية**

Most aircraft are flying at high altitude which can cause icing accumulation, changes the wing profile and the aerodynamic characteristics of wing. The anti-icing bleed air system (AI-BAS) is considered an important system used to prevent the icing accumulation using hot air from engine (bleed); but it may lead to reduced engine performance. This work aims to study the effect of bleed variation on engine performance and (AI-BAS). The bleed air was extracted from the intermediate stage of engine compressor. MATLAB software was used to simulate the engine cycle and estimate performance. The performance of (AI-BAS) was investigated computationally for different bleed air ratios. The computational domain was constructed and solved by ANSYS software for partial span model (PSM) with suitable periodic conditions. The obtained results show that the engine performance characteristics are decreased with increasing of anti-icing bleed air and the overall efficiency of engine is decreased by about 1.29%, 2.63% and 4.01%, for bleed air ratio of 0.02, 0.04 and 0.06 respectively. On the other hand, the average temperature of wing leading edge was increased by about 2.68% and 4.86%, for bleed air ratio of 0.04 and 0.06 respectively compared to the bleed air ratio of 0.02