

Reducing Weight and Fuel Consumption of Civil Aircraft by EML

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Abstract : Electromagnetic launch systems have been proposed for military applications to accelerate jet planes on aircraft carriers. This paper proposes the implementation of similar technology to aid civil aircraft take-off, which can provide significant economic, environmental and technical benefits. Assisted launch has the potential of reducing ground noise and emissions near airports and improving overall aircraft efficiency through reducing engine thrust requirements. This paper presents a take-off performance analysis for an Airbus A320-200 taking off with and without the assistance of the electromagnetic catapult. Assisted take-off allows for a significant reduction in take-off field length, giving more capacity with existing airport footprints and reducing the necessary footprint of new airports, which will both reduce costs and increase the number of suitable sites. The electromagnetic catapult may allow the installation of smaller engines with lower rated thrust. The consequent fuel consumption and operational cost reduction are estimated. The potential of reducing the aircraft operational costs and the runway length required making electromagnetic launch system an attractive solution to the air traffic growth in busy airports.

Keywords : electromagnetic launch, fuel consumption, take-off analysis, weight reduction

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