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Application of Co-Flow Jet Concept to Aircraft Lift Increase

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Abstract : Present project is aimed at increasing the amount of lift produced by typical airfoil. This is achieved by its modification into the co-flow jet structure where a new internal flow is created inside the airfoil from well-designed apertures on its surface. The limit where produced excess lift overcomes the weight of pumping system inserted in airfoil upper portion, and drag force is converted into thrust is discussed in terms of airfoil velocity and angle of attack. Two normal and co-flow jet models are numerically designed and experimental results for both fabricated normal airfoil and CFJ model have been tested in low subsonic wind tunnel. Application has been made to subsonic NACA 652-415 airfoil. Produced lift in CFJ airfoil indicates a maximum value up to a factor of 5 above normal airfoil nearby flow separation ie in relatively weak flow distribution.

Keywords : flow Jet, lift coefficient, drag coefficient, airfoil performance
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