J. Appl. Environ. Biol. Sci., 5(8S)519-521, 2015

ISSN: 2090-4274
Journal of Applied Environmental and Biological Sciences
www.textroad.com

Analysis of drag coefficient and angle of wings installation effect on band length

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Received: March 8, 2015
Accepted: May 10, 2015

ABSTRACT

In aircraft design we should always seek ways to can do the required condition to quality for the best way and for physical and environmental characteristics and cost provide desired situation. One of the best approaches is appropriate selection of full Air wing, in such a way that in addition to provide flight appropriate parameters, can do some changes on environmental situation such as length of takeoff runway. In this article 3 full Air 2410, 2409, 2408 Air foil series of Naka are investigated by use of analytical software XFLR5. The results show that without any changes in motor, weight of plane and so on. Parameters we can design any plane by use of appropriate selection of airfoil, take off band that is suitable with special condition of each plane.

KEYWORDS: Length of Takeoff Runway, Drag Coefficient, Angle of Wing Installation.

1. INTRODUCTION

In many of plots because of assign the bulk of budget to construction of plane, for design and construction of gang up there is lack of budget. In this study use of software shows that with right and suitable air Foil band can design a band without changing in budget or Factors such as type of engine or weight of plane that be match with all considered situations [1].

2. Achieving installation of wing angle is proportional to drag coefficient

In XFLR5 design according to investigation of wing in this study is fixed, and because the air Foil main criterian is satisfaction of flying condition, the obtained angle from software is same as installation of wing angle. (Figure 1). Because in this study we want to investigate the effect of installation of wing angle and drag coefficient on Runway, installation of wing angle and drag coefficient are considered as lift coefficient for each of air foil that be same.

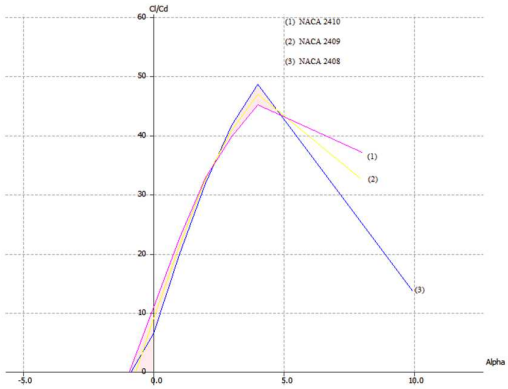

Fig1. Installation of angle for three airfoil

3. Compare the relative value of each air foil together

After calculations with software on each airfoil, lift coefficient values, drag and installation angle for each are obtained in Figures 2, 3 and 4. According to drag coefficient and installation angle of each airfoil [2] are considered in

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such a way that lift coefficient in each airfoil are the same to this point that effect of these 2 parameter s in equation1 was more.

$$Sg = \frac{m}{\rho SKrCl} \ln \left[\frac{\frac{T}{W}}{\frac{T}{W} - \mu - Kr} \right] \quad (1)$$

Now according to obtained amounts in Figures 2,3 and 4 and equation 1 , if all the amounts expect in this relation for each plane is assumed fix and so gang up length for 3 air foils are obtained as:
Sg2408<Sg2409<Sg2410

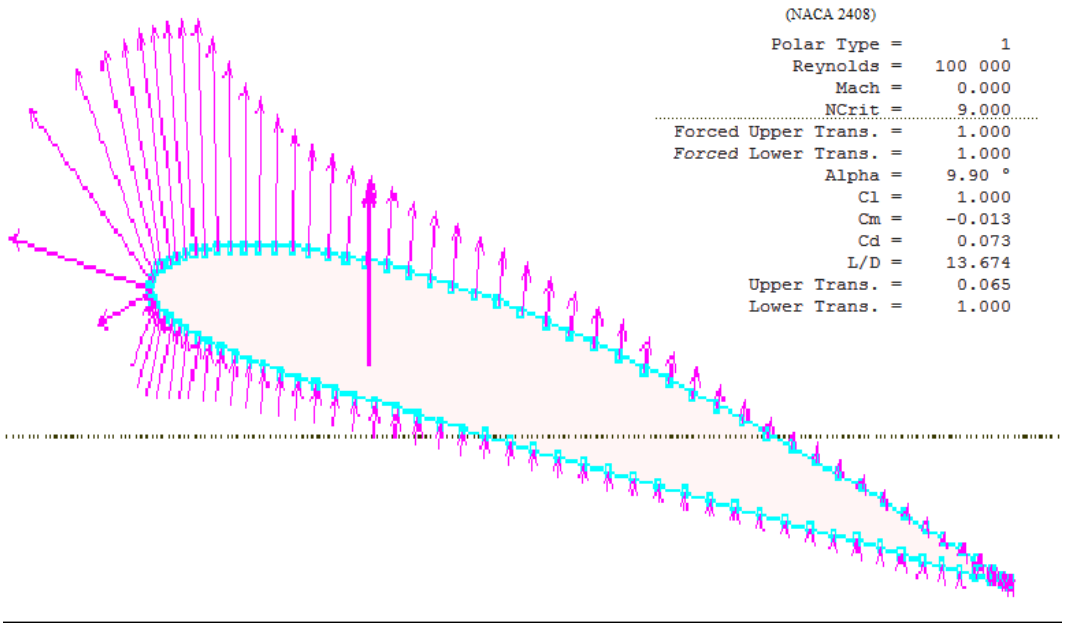

Fig2. NACA airfoil 2408

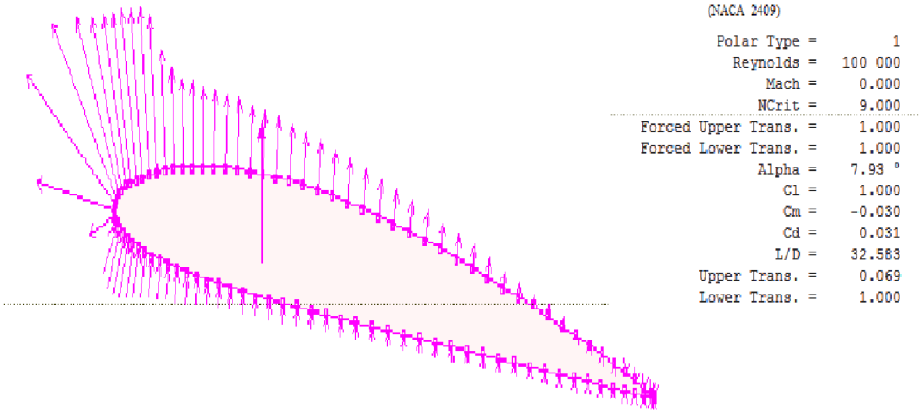

Fig2. NACA airfoil 2409

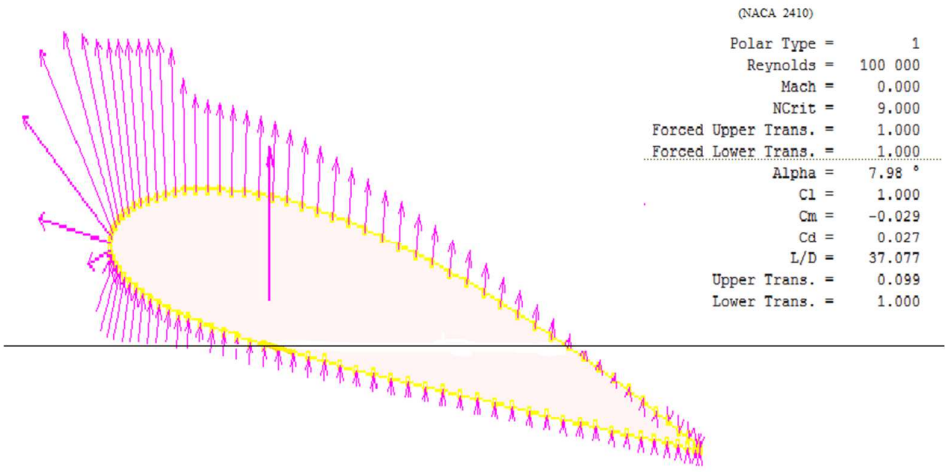

Fig3. NACA airfoil 2410

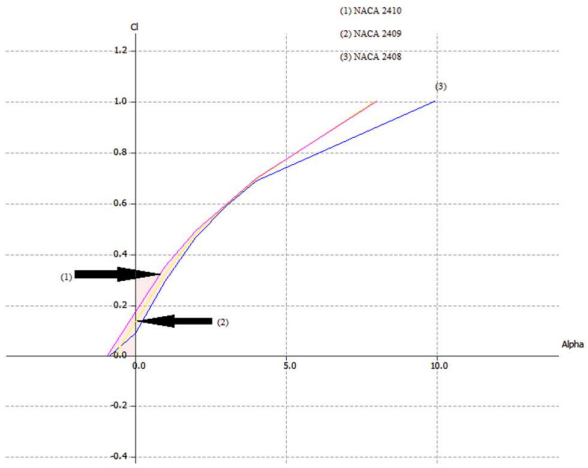

Fig 4. The coefficient of variation the angle of attack

5. CONCLUSION

According to studies can conclude that whatever the airfoil thickness is less, and chord line be close to underside, the considered length of band be lees. Also our investigations is consistent with soil band we can conclude from Figure 4 that , length band of each airfoil is different with the other airfoil but quality fail or of them are same and from Figure 1 we can say that installation angle of all 3 airfoils are same.

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