

Enter case reference: tryout  
Reading in parameter file: Parfiles/tryout.txt

Section identifier: naca4412\_yt\_v5  
Number of panels: 400  
Reynolds number: 0.5 million  
Range of incidences (degrees): -10:1:10

Results for alpha = -10.000 degrees

Lift coefficient: -0.344  
Drag coefficient: 0.03700  
Lift-to-drag ratio: -9.299

Upper surface boundary layer:  
Laminar separation at x = 0.856  
Turbulent reattachment at x = 0.886

Lower surface boundary layer:  
Laminar separation at x = 0.007  
Turbulent separation at x = 0.012

Results for alpha = -9.000 degrees

Lift coefficient: -0.227  
Drag coefficient: 0.02778  
Lift-to-drag ratio: -8.180

Upper surface boundary layer:  
Laminar separation at x = 0.836  
Turbulent reattachment at x = 0.866

Lower surface boundary layer:  
Laminar separation at x = 0.007  
Turbulent separation at x = 0.012

Results for alpha = -8.000 degrees

Lift coefficient: -0.110  
Drag coefficient: 0.02069  
Lift-to-drag ratio: -5.334

Upper surface boundary layer:  
Laminar separation at x = 0.816  
Turbulent reattachment at x = 0.846

Lower surface boundary layer:  
Laminar separation at x = 0.007  
Turbulent separation at x = 0.012

Results for alpha = -7.000 degrees

Lift coefficient: 0.007  
Drag coefficient: 0.01537  
Lift-to-drag ratio: 0.429

Upper surface boundary layer:  
Laminar separation at x = 0.795  
Turbulent reattachment at x = 0.826

Lower surface boundary layer:  
Laminar separation at x = 0.007  
Turbulent separation at x = 0.012

Results for alpha = -6.000 degrees

Lift coefficient: 0.124  
Drag coefficient: 0.01153  
Lift-to-drag ratio: 10.714

Upper surface boundary layer:  
Laminar separation at x = 0.770  
Turbulent reattachment at x = 0.800

Lower surface boundary layer:  
Laminar separation at x = 0.007  
Turbulent separation at x = 0.012

Results for alpha = -5.000 degrees

Lift coefficient: 0.240  
Drag coefficient: 0.00887  
Lift-to-drag ratio: 27.116

Upper surface boundary layer:  
Laminar separation at x = 0.745  
Turbulent reattachment at x = 0.775

Lower surface boundary layer:  
Laminar separation at x = 0.007  
Turbulent separation at x = 0.012

Results for alpha = -4.000 degrees

Lift coefficient: 0.357  
Drag coefficient: 0.00716  
Lift-to-drag ratio: 49.874

Upper surface boundary layer:  
Laminar separation at x = 0.715

Turbulent reattachment at  $x = 0.745$

Lower surface boundary layer:

Laminar separation at  $x = 0.007$

Turbulent separation at  $x = 0.012$

Results for  $\alpha = -3.000$  degrees

Lift coefficient: 0.474

Drag coefficient: 0.00624

Lift-to-drag ratio: 75.930

Upper surface boundary layer:

Laminar separation at  $x = 0.674$

Turbulent reattachment at  $x = 0.699$

Lower surface boundary layer:

Laminar separation at  $x = 0.007$

Turbulent separation at  $x = 0.012$

Results for  $\alpha = -2.000$  degrees

Lift coefficient: 0.591

Drag coefficient: 0.00583

Lift-to-drag ratio: 101.236

Upper surface boundary layer:

Laminar separation at  $x = 0.639$

Turbulent reattachment at  $x = 0.664$

Lower surface boundary layer:

Laminar separation at  $x = 0.007$

Turbulent separation at  $x = 0.012$

Results for  $\alpha = -1.000$  degrees

Lift coefficient: 0.707

Drag coefficient: 0.00582

Lift-to-drag ratio: 121.488

Upper surface boundary layer:

Laminar separation at  $x = 0.603$

Turbulent reattachment at  $x = 0.628$

Lower surface boundary layer:

Laminar separation at  $x = 0.007$

Turbulent separation at  $x = 0.012$

Results for  $\alpha = 0.000$  degrees

Lift coefficient: 0.823  
Drag coefficient: 0.00617  
Lift-to-drag ratio: 133.515

Upper surface boundary layer:  
Laminar separation at  $x = 0.557$   
Turbulent reattachment at  $x = 0.583$

Lower surface boundary layer:  
Laminar separation at  $x = 0.007$   
Turbulent separation at  $x = 0.012$

Results for  $\alpha = 1.000$  degrees

Lift coefficient: 0.939  
Drag coefficient: 0.00830  
Lift-to-drag ratio: 113.160

Upper surface boundary layer:  
Laminar separation at  $x = 0.445$   
Turbulent reattachment at  $x = 0.465$

Lower surface boundary layer:  
Laminar separation at  $x = 0.012$   
Turbulent reattachment at  $x = 0.017$   
Turbulent separation at  $x = 0.287$

Results for  $\alpha = 2.000$  degrees

Lift coefficient: 1.055  
Drag coefficient: 0.01060  
Lift-to-drag ratio: 99.472

Upper surface boundary layer:  
Laminar separation at  $x = 0.409$   
Turbulent reattachment at  $x = 0.429$

Lower surface boundary layer:  
Laminar separation at  $x = 0.042$   
Turbulent reattachment at  $x = 0.053$

Results for  $\alpha = 3.000$  degrees

Lift coefficient: 1.170  
Drag coefficient: 0.01122  
Lift-to-drag ratio: 104.266

Upper surface boundary layer:  
Laminar separation at  $x = 0.378$

Turbulent reattachment at  $x = 0.398$   
Turbulent separation at  $x = 1.000$

Lower surface boundary layer:  
Laminar separation at  $x = 0.047$   
Turbulent reattachment at  $x = 0.053$

Results for  $\alpha = 4.000$  degrees

Lift coefficient: 1.285  
Drag coefficient: 0.01206  
Lift-to-drag ratio: 106.511

Upper surface boundary layer:  
Laminar separation at  $x = 0.347$   
Turbulent reattachment at  $x = 0.368$   
Turbulent separation at  $x = 1.000$

Lower surface boundary layer:  
Laminar separation at  $x = 0.047$   
Turbulent reattachment at  $x = 0.053$

Results for  $\alpha = 5.000$  degrees

Lift coefficient: 1.400  
Drag coefficient: 0.01299  
Lift-to-drag ratio: 107.743

Upper surface boundary layer:  
Laminar separation at  $x = 0.322$   
Turbulent reattachment at  $x = 0.342$   
Turbulent separation at  $x = 0.995$

Lower surface boundary layer:  
Laminar separation at  $x = 0.098$   
Turbulent reattachment at  $x = 0.109$

Results for  $\alpha = 6.000$  degrees

Lift coefficient: 1.514  
Drag coefficient: 0.01399  
Lift-to-drag ratio: 108.197

Upper surface boundary layer:  
Laminar separation at  $x = 0.301$   
Turbulent reattachment at  $x = 0.322$   
Turbulent separation at  $x = 0.995$

Lower surface boundary layer:  
Laminar separation at  $x = 0.164$

Turbulent reattachment at  $x = 0.213$

Results for  $\alpha = 7.000$  degrees

Lift coefficient: 1.627  
Drag coefficient: 0.02158  
Lift-to-drag ratio: 75.430

Upper surface boundary layer:  
Laminar separation at  $x = 0.042$   
Turbulent reattachment at  $x = 0.051$   
Turbulent separation at  $x = 0.970$

Lower surface boundary layer:  
Laminar separation at  $x = 0.169$   
Turbulent reattachment at  $x = 0.208$

Results for  $\alpha = 8.000$  degrees

Lift coefficient: 1.741  
Drag coefficient: 0.02583  
Lift-to-drag ratio: 67.385

Upper surface boundary layer:  
Laminar separation at  $x = 0.001$   
Turbulent reattachment at  $x = 0.002$   
Turbulent separation at  $x = 0.945$

Lower surface boundary layer:  
Laminar separation at  $x = 0.169$   
Turbulent reattachment at  $x = 0.198$

Results for  $\alpha = 9.000$  degrees

Lift coefficient: 1.853  
Drag coefficient: 0.02920  
Lift-to-drag ratio: 63.470

Upper surface boundary layer:  
Laminar separation at  $x = 0.001$   
Turbulent reattachment at  $x = 0.002$   
Turbulent separation at  $x = 0.926$

Lower surface boundary layer:  
Laminar separation at  $x = 0.174$   
Turbulent reattachment at  $x = 0.198$

Results for  $\alpha = 10.000$  degrees

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Lift coefficient: 1.965  
Drag coefficient: 0.03329  
Lift-to-drag ratio: 59.044
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Upper surface boundary layer:  
  Laminar separation at x = 0.001  
  Turbulent reattachment at x = 0.002  
  Turbulent separation at x = 0.896
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Lower surface boundary layer:  
  Laminar separation at x = 0.179  
  Turbulent reattachment at x = 0.198
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