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AE655A

Transonic Aerodynamics

**Ansys Simulations over a bi-convex airfoil for Transonic flow**

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### Objective: Run Ansys simulation over a given profile y = x\*(1-x) at Mach number 1.2 for 0-degree and 4-degree angle of attack.

### Introduction:- For given profile we will get data set and then import it in Ansys to do simulations, basically there are 4 steps by which simulation is done in ansys.

### 1.Geometry

### 2. Mesh

### 3. Setup and Solution

### 4. Result

### Procedure:-

### Step1:- Geometry Creation for given profile at 0-degree and 4-degree angle of attack.

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### 

### Step2 creating Mesh:-

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### Step 3: Setup and Results:-

### Select->parallel solver 4->start.

### Solutions.

### Models->Energy (on)->Viscosity(inviscid).

### 2. Material->air->Density->ideal Gas.

### 3. Boundary Condition->inlet->pressure far field->Enter Mach no(1.2)->Temperature(288k)->operating pressure(101325).

### 4.Report Definition-> Enter drag ,cd,cl,Lift,cm. Note-(for 4 degree x = 0.9975,y= 0.0697.

### 5. Initialization->Standard initialization ->compute from inlet.

### 6. Calculation->iteration->900

### 

### Step 4. Results:-

### Select ->location->plane->apply.

### 2. select->contour->pressure,temperature,velocity->apply.

### 3. Hence we get contour of different Thermodynamics quantities

### Pressure Contour, Mach Number Contour For 0-degree: -

### 

### Pressure and Mach Number Contour for 4-degree:-

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### Results:-

### For 0-degree AoA:-

### Lift = 0 N ; Drag = 334.217 N ; Moment = 0;

### For 4-degree angle of attack:-

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### References:-