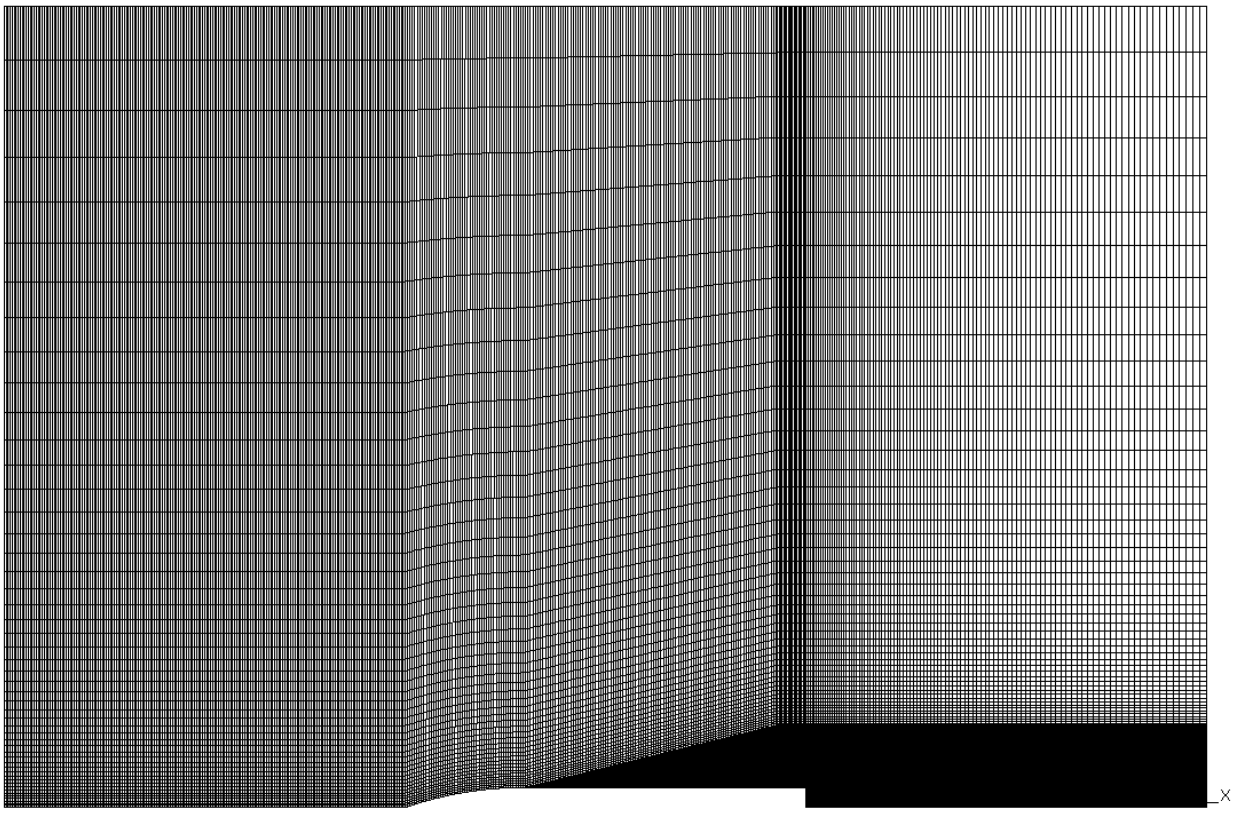
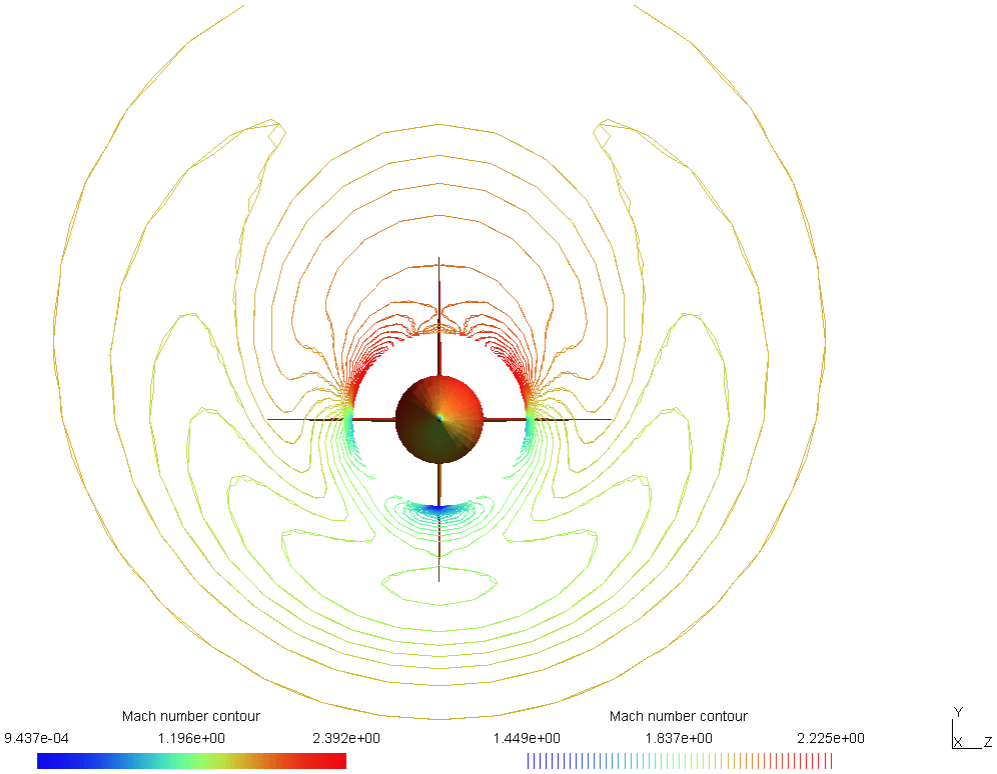
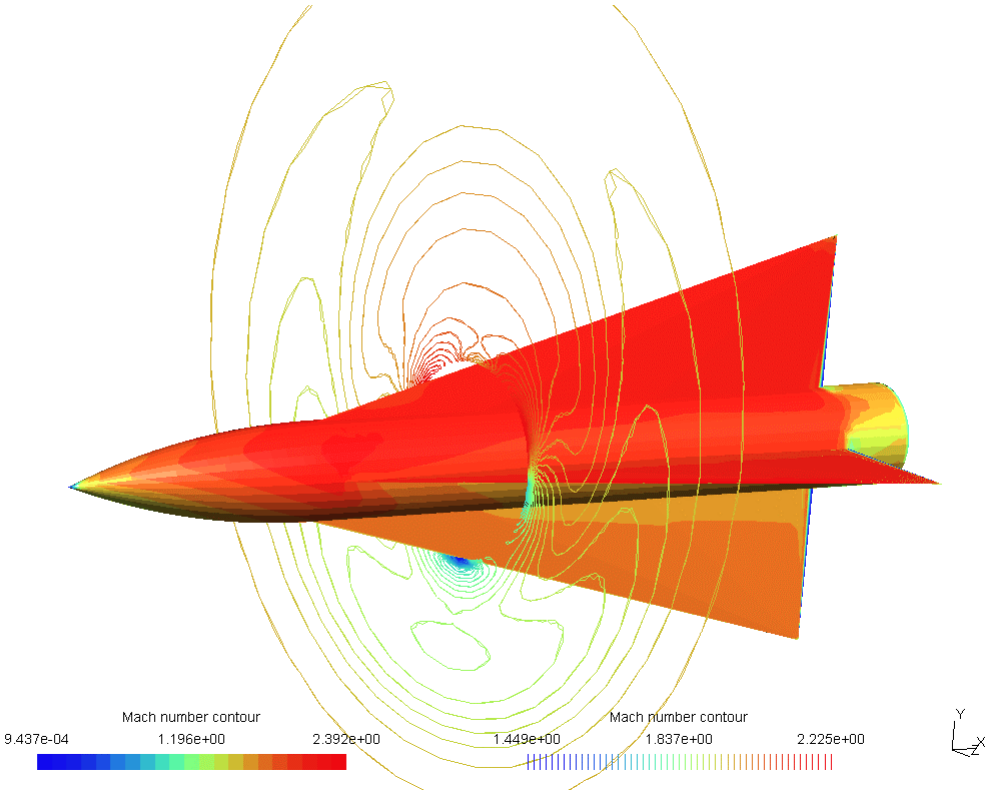
Problem: Mach 1.97 flows past NACA RM-A56G16 missile at 12^o angle of attack.

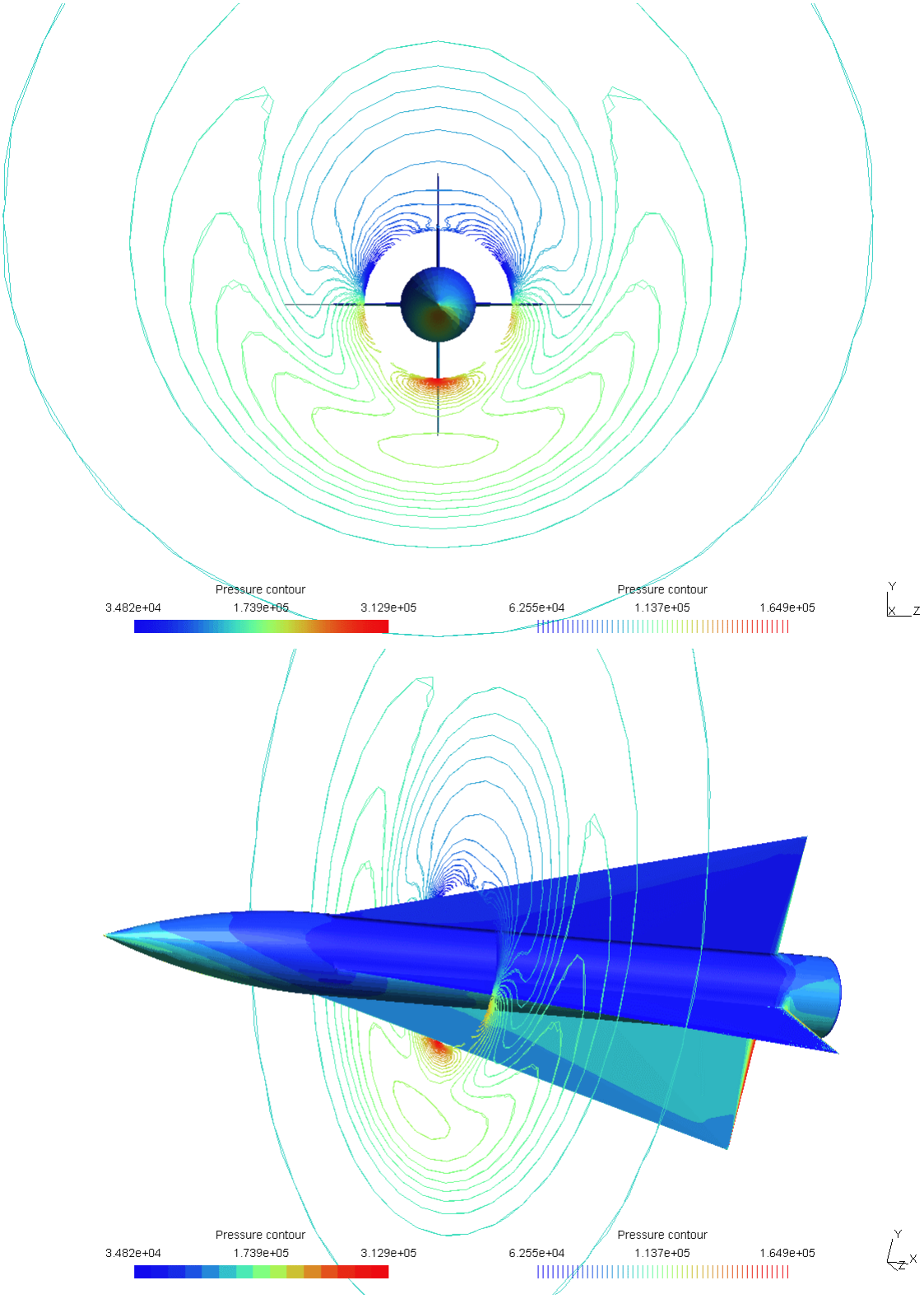
* 2D mesh consists of 50010 elements and 50061 nodes
* 25 minutes to generate the 2D mesh
* Assign triangular wing surface (B1-W5, AR=1)
* Sweep 2D mesh around axis to generate 3D mesh
* 3D mesh includes 1,584,032cells and 1,632,190 nodes.
* 64 pyramids, 12,800 prisms and 1,571,168 hexahedrons



Flusol calculations	Mach number	Aplha (Degrees)	Xcp/d
Inviscid	1.97	5.00	6.516
Inviscid	1.97	12.00	6.487


Mach number contour
9.437e-04
1.196e+00
2.392e+00
Mach number contour
1.449e+00
1.837e+00
2.225e+00
Y
X
Z


Mach number contour
9.437e-04
1.196e+00
2.392e+00
Mach number contour
1.449e+00
1.837e+00
2.225e+00
Y
X
Z


Pressure contour
3.482e+04
1.739e+05
3.129e+05
Pressure contour
6.255e+04
1.137e+05
1.649e+05
Y
X
Z
Pressure contour
3.482e+04
1.739e+05
3.129e+05
Pressure contour
6.255e+04
1.137e+05
1.649e+05
Y
Z
X

****
**** Mesh generation file for : f19-RM-A56G16 **********
****

```
**begin
solver = mesh
dimension = ax
adapt = on
file = f19
convert = 3d
wing = on
*title
mach 1.97 flow past a NACA-RM-A56G16 missile at 5 deg angle of attack
*sweep
circle = full
elem = 32
**  Generating full or half circle       , IHALF = ',I2
**  Total degree in theta direction      , KDGRE = ',I3
**  Total element in theta direction     , NTH   = ',I3
**  Ratio of radius in x-z to x-y planes , RATIO = ',E12.6
**  Set parameter value on wing surface  , NPARAM= ',I3
**  2nd and 3rd wing location is +- locations from'
**  The symmetric plane                  , MLOC  = ',I3
*mesh
set = 1
type = patch
part = inlet_low
elex = 200
eley = 50
x1 = -10.0
y1 =  0.0
x2 =  0.0
y2 =  0.0
x3 =  0.0
y3 =  20.0
x4 =  -10.0
y4 =  20.0
farfield = 3 4
boundary = 1 vy 0.0
dymin = 0.05
stretch = 1
end
** nose ogive
set = 2
type = patch
part = nose
elex = 50
eley = 50
x1 = 0.0
y1 = 0.0
x2 = 3.0
y2 = 0.5
x3 = 3.0
y3 = 20.0
x4 = 0.0
y4 = 20.0
```

```
ityb = 1
slopb = 9.25
solid = 1
farfield = 3
dymin = 0.05
stretch = 1
end
** cylinder region
set = 3
type = patch
part = cylinder_above_wing
elex = 100
eley = 50
x1 = 3.0
y1 = 0.5
x2 = 9.25
y2 = 2.05
x3 = 9.25
y3 = 20.0
x4 = 3.0
y4 = 20.0
farfield = 3
dymin = 0.05
stretch = 1
end
** wing
set = 4
type = patch
part = wing
elex = 100
eley = 100
thick = 0.004
wing = 4
nwing = 3
**
** nwing = 1, double circular arc (biconvex)
** nwing = 2, 3  for double wedge, PENT= 0.5, 1/3, or general
** nwing = 5, for airfoil
** nwing = 6, for ellipse cross section
**
x1 = 3.0
y1 = 0.5
x2 = 9.25
y2 = 0.5
x3 = 9.25
y3 = 2.05
x4 = 9.25
y4 = 2.05
solid = 1
end
set = 5
** after wing above body
type = patch
part = after_wing_above_body
elex = 20
eley = 100
x1 = 9.25
```

```
y1 = 0.5
x2 = 10.0
y2 = 0.5
x3 = 10.0
y3 = 2.05
x4 = 9.25
y4 = 2.05
solid = 1
end
** tail
set = 6
type = patch
part = after_wing_top
elex = 20
eley = 50
x1 = 9.25
y1 = 2.05
x2 = 10.0
y2 = 2.05
x3 = 10.0
y3 = 20.0
x4 = 9.25
y4 = 20.0
farfield = 3
dymin = 0.05
stretch = 1
end
set = 7
type = patch
part = base_tail
elex = 100
eley = 40
x1 = 10.0
y1 = 0.0
x2 = 20.0
y2 = 0.0
x3 = 20.0
y3 = 0.5
x4 = 10.0
y4 = 0.5
solid = 4
farfield = 2
boundary = 1 vy 0.0
strlx = 1
dxlmin = 0.05
strux = 1
dxumin = 0.05
end
set = 8
** after wing above base
** base section
type = patch
part = after_wing_above_base
elex = 100
eley = 100
x1 = 10.0
y1 = 0.5
```

```
x2 = 20.0
y2 = 0.5
x3 = 20.0
y3 = 2.05
x4 = 10.0
y4 = 2.05
farfield = 2
strlx = 1
dxlmin = 0.05
strux = 1
dxumin = 0.05
end
set = 9
** after base top outlet
type = patch
part = after_base_top_outlet
elex = 100
eley = 50
x1 = 10.0
y1 = 2.05
x2 =  20.0
y2 =  2.05
x3 =  20.0
y3 =  20.0
x4 =  10.0
y4 =  20.0
farfield = 2 3
strlx = 1
dxlmin = 0.05
strux = 1
dxumin = 0.05
dymin = 0.05
stretch = 1
end
*property
cfl, 0.95
scale = 0.03175
*cntrl
iter = 1
nprint = 1
fmach = 1.97
**refl = 0.03175
refl = 1.0
redn = 1.225
repr = 1.0133e5
rarea = 0.00079173
nfar = 2
*initial condition
1,1,1, 1.225,667.74,58.4198,0.0,1.0133e5
*last
```