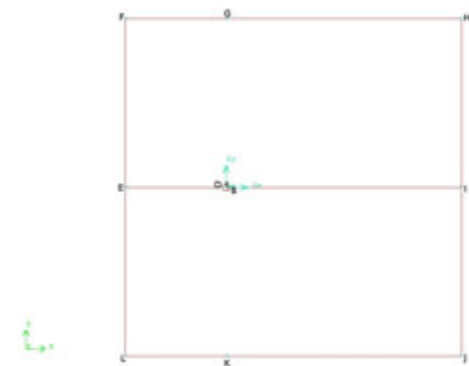


# FLUENT - Flow Past a Cylinder - Step 7

- Problem Specification.
- 1. Create Geometry in GAMBIT.
  - 2. Mesh Geometry in GAMBIT.
  - 3. Specify Boundary Types in GAMBIT.
  - 4. Set Up Problem in FLUENT.
  - 5. Solve.
  - 6. Analyze Results.
  - 7. **Change the Domain Size.**
  - 8. Unsteady Flow.
- Citations

## Change the Domain Size.

Change the domain size to 50D\*50D



Keep the points on the cylinder unchanged.

| Label | X   | Y   | Z |
|-------|-----|-----|---|
| E     | -15 | 0   | 0 |
| F     | -15 | 25  | 0 |
| G     | 0   | 25  | 0 |
| H     | 35  | 25  | 0 |
| I     | 35  | 0   | 0 |
| J     | 35  | -25 | 0 |
| K     | 0   | -25 | 0 |
| L     | -15 | -25 | 0 |

Keep the number of mesh vertex on the cylinder the same with 10d x 20d geometry.

Edge DE: Ratio 0.94 and interval count 50

Before meshing DE, we change the direction of DE: first shift + left click the edge, then middle click the edge, the direction changes from DE to ED. It looks as below:



The red arrow shows the direction of the edge.

Edge BI: Ration 1.03 and interval count 120

Edge EF and EL: Ration 1.05 and interval count 25 for each

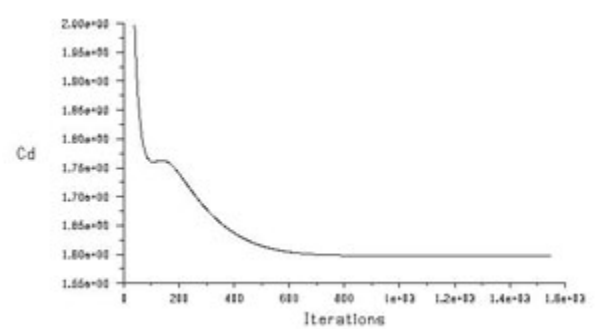
Edge HI and JI: Ration 1 and interval count 20 for each

Edge FG and LK: Ration 1 and interval count 15 for each

Edge GH and KJ: Ration 1 and interval count 36 for each

Repeat the mesh steps and export a new mesh for simulation. Also, repeat the solution procedure to solve the flow.

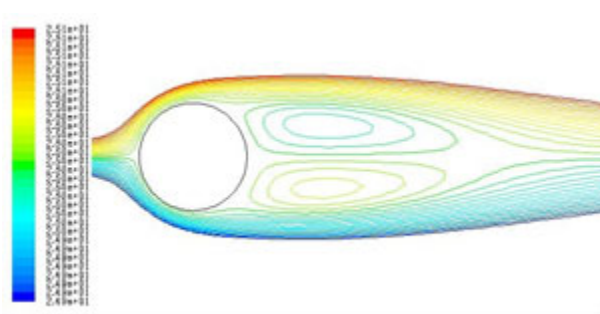
Plot convergence of the drag coefficient versus the number of iterations. Report the drag coefficient and compare it with the result in literature as shown in **Table 1**.



Plot streamlines. Plot pressure, velocity, vorticity contours.

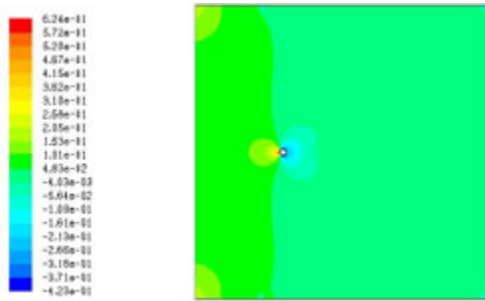
Streamline

Display > Contours >

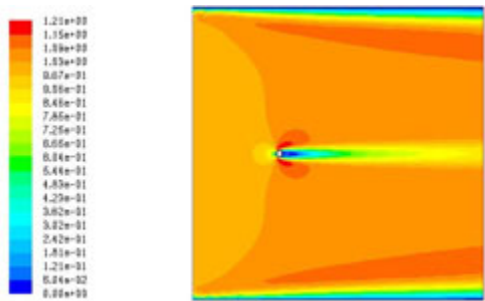


Contours

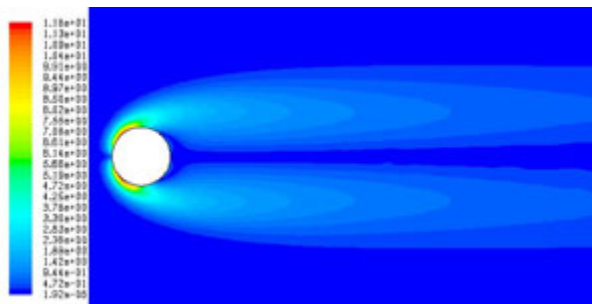
Contour of the dimensionless pressure



Contour of the velocity magnitude (normalized by the freestream velocity)



Vorticity Magnitude (normalized by  $U/a$ )



Go to [Step 8: Unsteady Flow](#).

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