FLUENT - Turbulent Flow Past a Sphere - Problem Specification

UNDER CONSTRUCTION

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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. Refine Mesh
Problem 1

Problem Specification

? Unknown Attachment

The purpose of this tutorial is to illustrate the setup and solution of a turbulent flow past a sphere. Flow past a sphere is one of the classical problems of fluid mechanics. For this problem, we will be looking at Reynolds number of 1.14E6.

$$Re = \frac{\rho V D}{\mu}$$

We know D = 6. To obtain *Re* = 1.14E6, we can arbitrarily set , *V* and , but will use the standard values in Fluent. For our case, let's set = 1.225 kg/m ^{3} , *V* = 2.7754 m/s and = 1.7894E-05 kg/ms.

Preliminary Analysis

For *Re* = 1.14E6, we are looking at turbulent flow. What will be the velocity profile of this flow? What will be the drag coefficient of the sphere? What will be the pressure coefficient around sphere? How will the streamlines around sphere look?

Let's start the modeling in our quest to find out the answer!

We'll create the geometry and mesh in GAMBIT which is the preprocessor for FLUENT, and then read the mesh into FLUENT and solve for the flow solution.

Go to Step 1: Create Geometry in GAMBIT

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