Steady Flow Past a Cylinder - Numerical Solution

Authors: John Singleton and Rajesh Bhaskaran, Cornell University

Numerical Solution

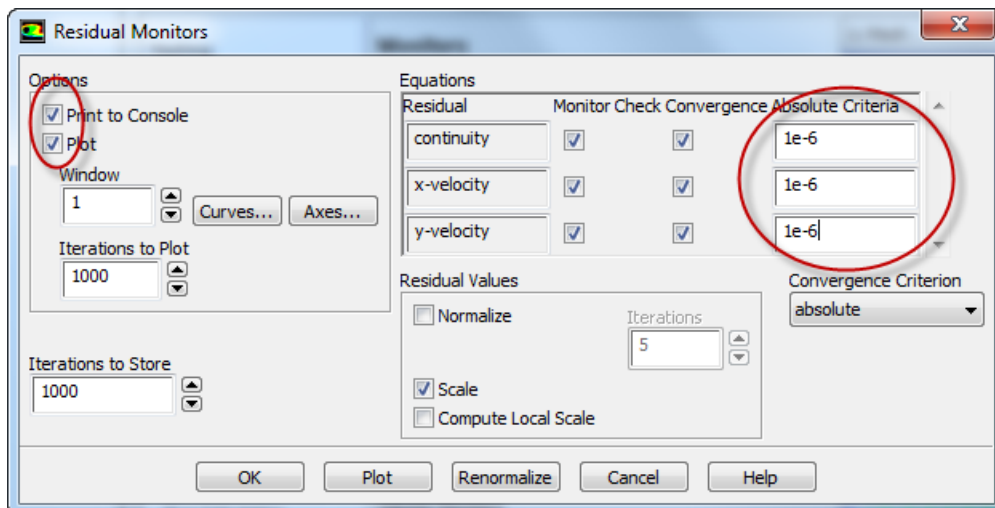**Second Order Upwind Momentum Scheme**

Solution > Solution Methods > Spatial Discretization.
Set ***Momentum*** to ***Second Order Upwind***

Convergence Criterion

Solution > Monitors > Residuals > Edit....
Set the ***Absolute Criteria*** for ***continuity***, ***x-velocity*** and ***y-velocity*** to 1e-6. Click ***ok***

Solution > Monitors > Create > Drag

NOTE: In ANSYS 18.2, implementing the drag monitor is slightly different. The pictures below do not match exactly with version 18.2. See this tutorial video for version 18.2.
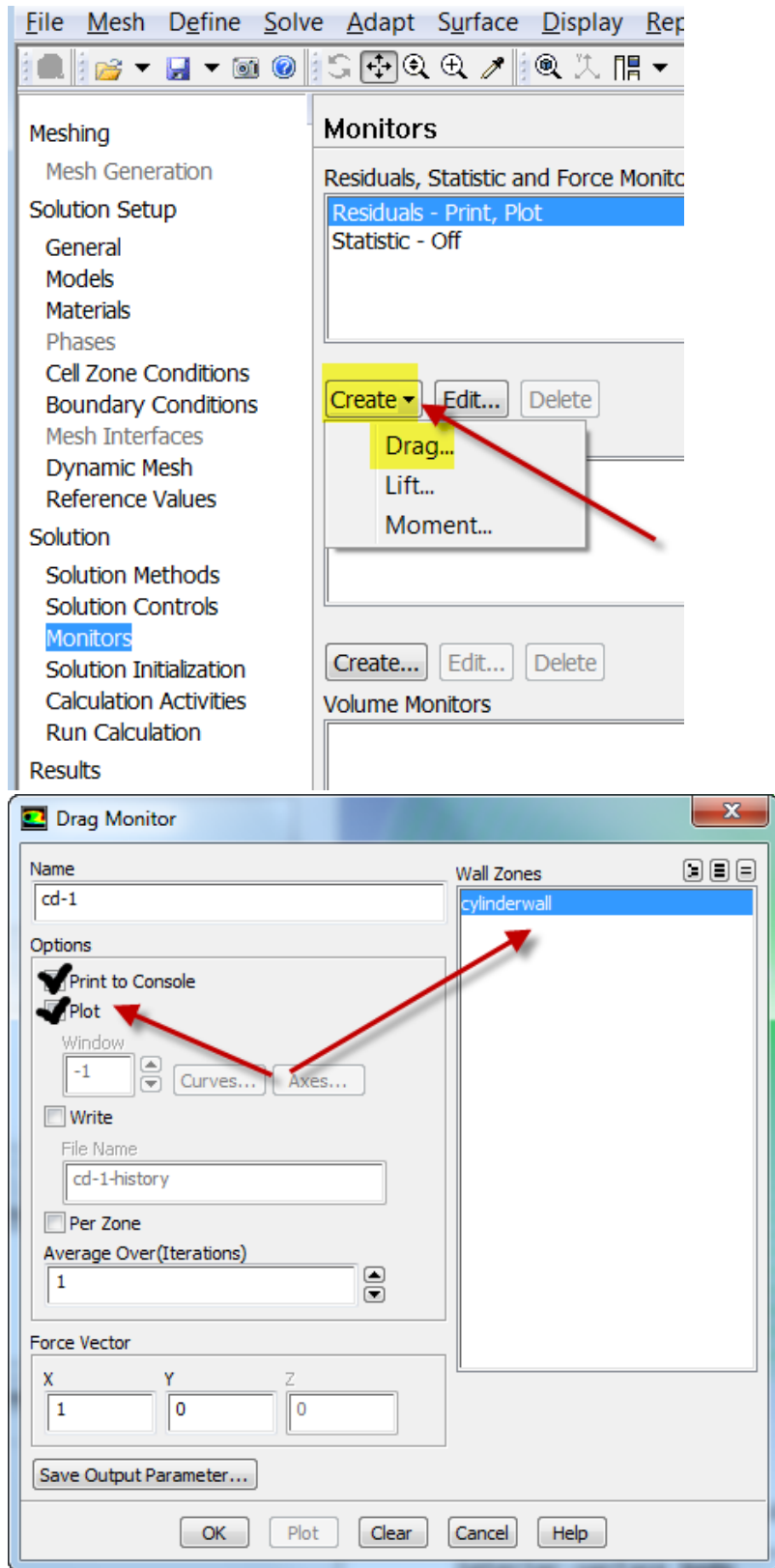
Then check **Print to Console** and **Plot**. Next, click **cylinderwall**, which is located under **Wall Zones**. Lastly, click **ok**

Initial Guess

Solution > Solution Initialization > Standard Initialization.
Set *Compute From* to *farfield1.* Alternately, you can simply set *X Velocity* to 1 m/s. Then, click *Initialize*.

Iterate Until Convergence

Solution > Run Calculation.
Set the *Number of Iterations* to *2000*. Then, click *Calculate*. (You may have to hit *Calculate* twice.) Now, have a cup of coffee. The solution should converge after approximately 1600 iterations. **NOTE**: In newer versions of ANSYS, solution may converge in lesser number of iterations.

Save Project