

# FLUENT - Turbulent Jet

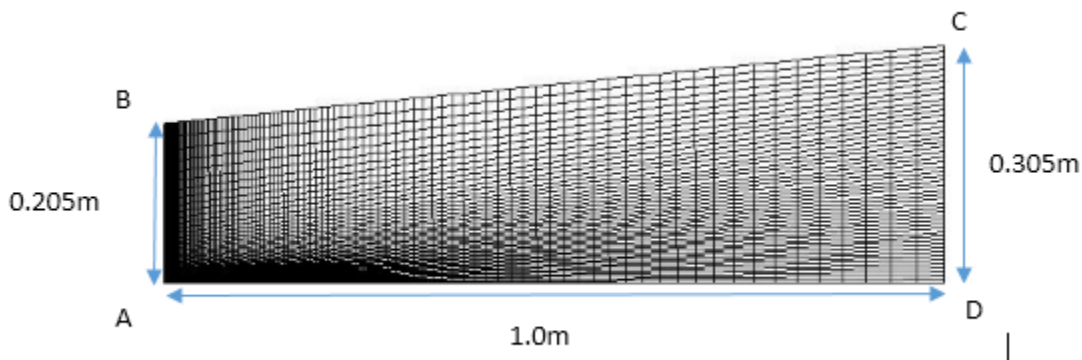
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## Problem Specification

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## Turbulent Jet

This tutorial was created using ANSYS 14.5. Additional analysis using Matlab is useful, but not required.



## Problem Statement

The laminar and turbulent jet will be set up similarly. The mesh has the dimensions in the above image, and the problem is axisymmetric. Farfield boundary conditions are lines BC and CD, and are specified with gauge pressure 0Pa. Line AD is the centerline (axis). Inlet 1 is on line AB from  $y = 0$  to  $y = 0.005\text{m}$  and is the jet inflow of  $1\text{m/s}$  in the axial direction. Inlet 2 is on line AB as well, from  $y = 0.005\text{m}$  to  $y = 0.205\text{m}$ . It has an inlet axial velocity of  $0\text{m/s}$ , and is also in the axial direction.

In the laminar case, the fluid is air, and should have a density of  $1\text{kg/m}^3$ , and viscosity  $0.000125\text{kg/m-s}$  ( $Re=40$ ). This viscosity will later need to be updated for the turbulent case to provide a higher Reynolds number.

### Reference:

Pope, S.B. *Turbulent Flows* (2000).

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