Matthew Soltesz

Texas Tech University

ME 3165-308

In this lab, the combined Coutte-Posiuelle Flow was examined, analyzed, and modeled in MatLab, where the flow was between plated in parallel to simulate pipe flow. The top plate has a velocity V, while the bottom plate remains stationary. This creates a pressure gradient in the flow, dP/dx. For this lab assignment we were tasked with changing several variables to see how the flow was affected: the pressure gradient dP/dx, the Reynolds Number, Re, the viscosity, mu, and the number of nodes in the pipe, n.

As the number of nodes is increased, the shape of the plot stayed relatively unchanged. This is easily implemented into the code. Though, when the height was increased, the plot became more ‘upright’, and increasing the length of the pipe widened the plot.. Changing the pressure gradient input and increasing this value would create a steeper curve, whereas decreasing the pressure gradient would have the inverse effect. If the value for the viscosity is altered, this would inversely affect the Reynold’s Number, which is used to determine what kind of flow is occurring in the pipe, either Laminar, Turbulent, or Transitional. Changing the value of the density of the fluid or the length of the pipe would proportionally affect the Reynold’s Number.

In conclusion, these values were entered into the MatLab code and computed and plotted, then altered to examine how the results were affected the flow pattern. No more than one value was changed at time in order to keep results constant.