**Mathematical Modeling**

Figure 1. Simple sketch of a part of the pipe

Assume :

1. The velocity of fluid are the function of position in radial.
2. Density of fluid, heat capacity of fluid, and coefficient heat transfer of fluid are constant around the pipe.
3. It is laminar flow

Data that used in this simulation :

Fluid that used in this simulation is water

The type of pipe that use in this simulation is NPS 4

Mass balance of fluid at the element volume

… (1)

Where,

… (2)

… (3)

Initial Conditions:

Boundary Conditions:

… (4)