

---

---

# PROBLEM 11-10N QUESTION

## Void, Quality And Pressure Drop Problem

---

---

Consider an adiabatic water channel 3 m long and 1 cm in diameter operating in homogeneous flow at 7.4 MPa pressure with a void (steam) distribution as shown in Fig. 1. The total flowrate is 0.3kg/s. Take the liquid viscosity at the operating conditions as  $8.7 \times 10^{-5}$  kg/m·s.

### Questions:

- Find the values of  $\alpha$ ,  $\beta$  and  $x$  for the channel, i.e., volume averaged values.
- Which values of Part A would change if the local flow velocities of the two phases remain equal but the flowrate was reduced sufficiently to yield a laminar velocity distribution condition ?
- Compute the pressure loss within the 3 m length.

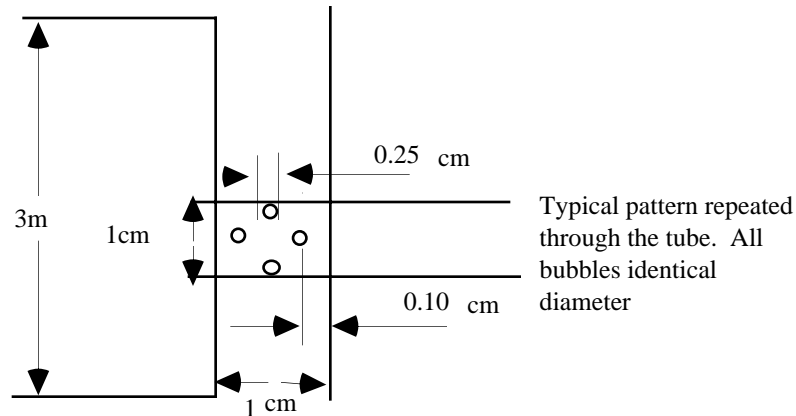


Figure 1