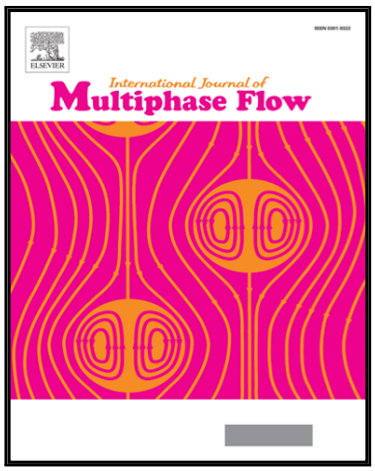

Experimental study of vertical co-current slug flow in terms of flow regime transition in relatively small diameter tubes

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Highlights

- The vertical upward slug flow in the range of liquid superficial velocity ($0.03 < j_l < 1.6$ m/s) were studied in tubular test section with the inside diameter of 25.4 mm.
- New structure of turbulent slug unit in strong relation with transition process was observed.
- The flooding shows great influence on the issue that whether the flow regime evolves into churn-turbulent flow or directly into annular flow.
- It was proposed that two structure parameters, i.e., void fraction of liquid slug and length ratio of Taylor bubble to liquid slug, are appropriate to be used as the transition criterion.