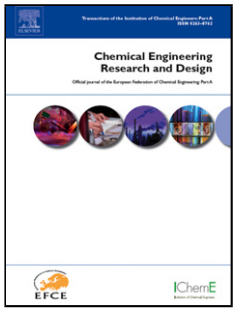


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# Modeling and simulation of downward vertical two-phase flow with pipe rotation

Farhad Raeiszadeh[a,b], *Ebrahim Hajidavalloo[a,b], Morteza Behbahaninejad[a], Pedram Hanafizadeh[c]

[a]*Mechanical Engineering Department, Shahid Chamran University of Ahvaz, Ahvaz, Iran.*

[b]*Drilling Research Center, Shahid Chamran University of Ahvaz, Ahvaz, Iran.*

[c]*School of Mechanical Engineering, College of Engineering, University of Tehran, Tehran, Iran.*

**Highlights**

- Numerical method can be successfully used to simulate the effect of pipe rotation on the downward two-phase flow patterns.
- Pipe rotation has a significant effect on two-phase flow patterns map.
- Pipe rotation change the flow regimes from bubbly to slug flow and from froth to annular flow.
- Froth zone may be disappeared in the flow map due to high rotation of pipe.

## Abstract

One of the major problems in two-phase flow research is prediction of flow pattern at different configurations without requiring expensive experimental tests. Numerical modeling and simulation is a suitable and emerging approach for this purpose which has many benefits including saving in time and cost. In this study, for the first time, the effect of pipe rotation on the flow patterns of air-water two-phase flow in downward direction was numerically studied. For this reason, Eulerian-Eulerian multi-fluid approach was utilized in Ansys-Fluent software. At first, apparent conditions of each regime in various