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A Computational Fluid Dynamics study on oil-in-water dispersion in vertical pipe flows

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Highlights

- 3D CFD model of oil-water pipe flow is developed by using ANSYS Fluent solver
- The Euler/Lagrange approach for the fluid and droplet phases is employed
- The shear-lift force is modelled through UDF code option as the external program
- The model is validated on the experimental data on oil-water two-phase pipe flows

Abstract

A three-dimensional steady-state mathematical model for an oil-in-water dispersed flow was developed to study the effects of lift force on the dispersed phase behaviour in a vertical pipe. The Euler/Lagrange multiphase scheme implemented in CFD code ANSYS Fluent was used to investigate the interaction between the oil droplets (dispersed phase) and water (continuous phase). The flow field of the continuous phase was resolved by solving the Reynolds-averaged Navier-

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