

High Viscous Oil-Water Flow: Experiments and CFD Simulations

Authors : A. Archibong-Eso, J. Shi, Y Baba, S. Alagbe, W. Yan, H. Yeung

Abstract : This study presents over 100 experiments conducted in a 25.4 mm internal diameter (ID) horizontal pipeline. Oil viscosity ranging from 3.5 Pa.s-5.0 Pa.s are used with superficial velocities of oil and water ranging from 0.06 to 0.55 m/s and 0.01 m/s to 1.0 m/s, respectively. Pressure gradient measurements and flow pattern observations are discussed. Numerical simulation of some flow conditions is performed using the commercial CFD code ANSYS Fluent® and the simulation results are compared with experimental results. Results indicate that CFD numerical simulation performed moderately well in predicting the flow configurations observed in this study while discrepancies were observed in the pressure gradient predictions.

Keywords : flow patterns, plug, pressure gradient, rivulet

Conference Title : ICFMFA 2015 : International Conference on Fluid Mechanics and Flow Analysis

Conference Location : Chicago, United States

Conference Dates : October 08-09, 2015