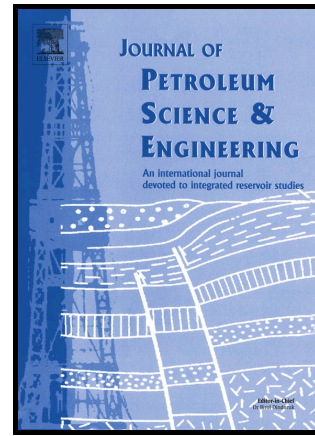


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A TRANSIENT ANALYSIS OF GAS-LIQUID SLUG FLOW INSIDE A HORIZONTAL PIPE USING DIFFERENT MODELS

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ABSTRACT

The present work compares different methodologies and experimental data in transient isothermal gas-liquid slug flows into a horizontal pipeline. Four cases are addressed: The expansion and compression of a gas-liquid mixture due to the variation of the inlet gas superficial velocity assuming the inlet liquid superficial velocity constant and varying the inlet liquid superficial velocity fixing the gas superficial velocity. The approximate Riemann solver based on the Drift-Flux Model (DFM) proposed in Santim and Rosa (2016), a simplifier Non-Pressure Wave (NPW) used on the MARLIM (Multiphase Flow and Artificial Lift Modelling) and the Two-Fluid Model (TFM) making use of OLGA[®] (Oil and GAs simulator) are tested against experimental data presented in Dalla Maria and Rosa (2016). Pressure and void fraction trends are used for the comparison. Furthermore the pressure and void fraction wave velocities are also measured. The main motivation is analyzing the transient behavior of the solutions obtained by the models, besides of to verify the solver which presents better accuracy and capability to capture the waves' velocities magnitude.

KEYWORDS

Drift-Flux model; Two-Fluid model; Non-Pressure Wave approach; slug flow; transient; horizontal pipe

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