

Abstract Submitted
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Jet-mixing of initially stratified flows¹ STUART WRIGHT, CHRISTOS MARKIDES, OMAR MATAR, Imperial College London — Low pipeline velocities in the oil-and-gas industry generally lead to liquid-liquid flows stratifying due to density differences. Pipeline stratified flows inherently have no single point for sub-sampling and phase slip leads to in situ phase fractions differing from input volume fractions. Establishing representative or average properties and phase fractions is therefore difficult for industry. This leads to sampling errors through measurement uncertainty. In-line mixing overcomes liquid-liquid stratification, establishing a liquid-liquid dispersion that minimises slip between phases. Here, we use jets-in-crossflow (JICF) as a means of mixing. We present results of CFD simulations using the volume-of-fluid method that demonstrate the breakup of stratification as a result of the application of JICF. A number of simple jet configurations are described, and their effectiveness in generating dispersions is compared. We also present preliminary experimental results based on the use of a matched-refractive-index method, laser-induced fluorescence, particle-tracking- and particle-image-velocimetry.

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