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Exploration of Gas-liquid Flow Mixing Region for the Purpose of Drift-flux Model Enhancement IVAN NEPOMNYASHCHIKH, JAMES LIBURDY, Oregon State University — The Drift-Flux model (DFM) is a powerful reduce order model that can be applied to gas-liquid flows. As applied to a one dimensional internal flow the model requires specification of two parameters: C_0 (distribution parameter) and v_s (weighted mean drift velocity). It is the goal of the current study to develop a Drift-Flux model appropriate for mixing regions in pipe flows for a range of gas-liquid flow parameters that addresses both steady and transient flows. This study focuses on high fidelity simulations useful for the determination of both C_0 and v_s. A wide range of both transient and steady flow conditions is used (inlet parameters and fluid properties). The result is a range of two phase flow conditions, or flow map regimes, within the mixing region. For each set of conditions results are used to identify values of C_0 and v_s. Functional relationships are then found to map these parameters to the flow map regimes. The extent and range of the functional relationships allows for a robust set of conditions that can be utilized in the Drift-Flux model. Using these results comparisons are made with existing functional forms of C_0 and v_s to help identify the sensitivity to the transient conditions of mixing.

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