A multi-dimensional drift flux mixture model for gas-droplet two-phase flow

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A multi-dimensional drift flux mixture model was used to simulate gas-droplet two-phase flows. The drift flux model was modified by considering the centrifugal force on the liquid droplets. Therefore the traditional 1D drift flux model was upgraded to multi-dimension, 2D and 3D. The slip velocities between the continual phase (gas) and the dispersed phase (liquid droplets) were able to calculate through multi-dimensional diffusion flux velocities based on the modified drift flux model. Through the numerical simulations comparing with the experiments and the simulations of other models on the backward-facing step and the water mist spray, the model was validated.

Keywords: Multi-dimension, Drift flux mixture model, Slip velocity, Two-phase flow, Droplet, Backward-facing step, Spray