

# Transition mechanism from bubble flow to slug flow in a riser

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An experiment was performed to examine the mechanism of flow pattern transition from bubble flow to slug flow in a riser. The flow was measured by a double resistivity probe system, and photographs of the flow were taken using strobe lights. The negative diffusion distance of bubbles was estimated using a voidage wave equation and compared with the interbubble distance. The flow pattern transition from bubble flow to slug flow occurred when the diffusion distance was larger than the interbubble distance. Conversely, when the diffusion distance was smaller than the interbubble distance, the bubble flow was sustained. Therefore, it is found that the negative diffusion caused by the instability of the voidage wave brings about the flow pattern transition.

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