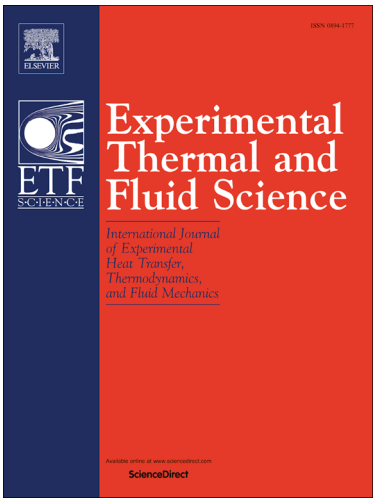

A unique methodology of objective regime classification for two phase flow based on the intensity of digital images

Shubhankar Chakraborty, P.K. das

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A unique methodology of objective regime classification for two phase flow based on the intensity of digital images

Shubhankar Chakraborty[1,]

Indian Institute of Science Bangalore, India, 560012

P. K. das

Indian Institute of Technology Kharagpur, India, 721302

Abstract

It is proposed that digital images can uniquely be used to identify the regimes during the flow of mixed phases using the temporal and spatial features of the flow. To demonstrate the potential of the postulation, the digital videographs of gas-liquid two-phase flow through a 50mm diameter vertical tube are considered. The intensity of each pixel is estimated through image processing. The time series of area-averaged intensity contains unique features to identify the flow regimes like that obtained from any conventional sensor. Further, the intensity values along lines in the direction of flow and perpendicular to it can be utilised to produce the spatio-temporal plots and the time history of the interfacial evolution which give signatures of the flow phenomenon hitherto unavailable from the use of conventional sensors. The methodology, compared successfully with the well-established flow regime map has enough

Email addresses: shubhankar04045@gmail.com (Shubhankar Chakraborty), pkd@mech.iitkgp.ernet.in (P. K. das)