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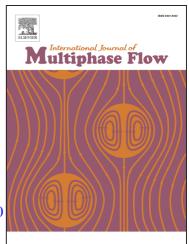
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Experimental Investigation

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M. Bottin*, J. P. Berlandis*, E. Hervieu*, M. Lance^o, M. Marchand**, O. C. Öztürk*
and G. Serre•

- * CEA/DEN/DM2S/STMF/LIEFT, 17 rue des Martyrs, 38054, Grenoble, France
- ** CEA/DRT/LITEN/DTBH/LTB, 17 rue des Martyrs, 38054, Grenoble, France
- CEA/DEN/DM2S/STMF/LMES, 17 rue des Martyrs, 38054, Grenoble, France
 - ❖CEA/DEN/CAD/DTN/STPA, 13108, St Paul lez Durance, France

OLMFA, Ecole Centrale de Lyon, 36 Avenue Guy de Collongue, 69134 Ecully, France Corresponding author: Muriel.Marchand@cea.fr Tel: +33 4 38 78 33 02

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Abstract

Experimental results for various water and air superficial velocities in developing adiabatic horizontal two-phase pipe flow are presented. Flow pattern maps derived from videos exhibit a new boundary line in intermittent regime. This transition from water dominant to water-gas coordinated regimes corresponds to a new transition criterion C_T =2, derived from a generalized representation with the dimensionless coordinates of Taitel, Y. & Dukler, A. E., 1976, American Institute of Chemical Engineers (AIChE) Journal, Vol. 22.

Velocity, turbulent kinetic energy and dissipation rate, void fraction and bubble size radial profiles measured at 40 pipe diameters for J_L =4.42 m/s by hot film velocimetry and optical probes confirm this transition: the gas influence is not continuous but strongly increases beyond J_G =0.06 m/s. The maximum dissipation rate, derived from spectra, is increased in two-phase flow by a factor 5 with respect to the

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