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Effect of Drag Reducing Polymers on Stratified and Stratified/Annular Flow in a Horizontal Duct PATRICIA PERNICA, BRIAN FLECK, TED HEIDRICK, University of Alberta — An investigation was carried out to determine the effects of a drag reducing additive (DRA) on two phase flow in horizontal stratified and stratified/annular flow patterns. Experiments were conducted in an air-water flow in a transparent rectangular channel of cross-section 25.4 mm $\times$ 50.8 mm and 2.5 m in length. Pressure drop measurements, wave characteristics and observations of entrainment with and without DRA are presented. A non-contact measurement technique using laser induced fluorescence and high speed videography was used to measure span-wise liquid wave heights and to characterize the air-water interface. Pressure drop was measured at the centerline of the duct over a one meter distance. The onset of entrainment was observed visually. Effects of DRA were observed even at a low concentration of 5ppm. This concentration yielded pressure drop reductions of 10-15% which correlate with previous experiments done in horizontal pipelines.[1] Observations also show dampening of roll waves and the suppression of atomization.

[1]Al-Sarkhi, A., Hanratty, T.J., Int J. Multiphase Flow, 27, 1151 (2001)

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