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Measurements of the average properties of a bidisperse suspension of bubbles rising in a vertical channel J.C. SERRANO-GARCIA, R. ZENIT, Universidad Nacional Autonoma de Mexico — This investigation presents an experimental study of a system for which the bubble size is not monodisperse. In this work an experimental equipment was designed to study the behaviour of a bidisperse suspension of bubbles rising in a vertical channel, in which the dual limit of small Weber and large Reynolds number is satisfied. Bubbles were produced using capillaries of two distinct inner diameters. Using water and water-glycerin mixtures, the range of Reynolds numbers was extended from 50 to 500, approximately. To avoid coalescence, a small amount of salt was added to the interstitial fluid, which did not affect the fluid properties significantly. Measurements of the size, bubble velocity, aspect ratio as well the equivalent diameter of the bubbles were obtained as a function of gas volume fraction. We found that the bidisperse nature of the flow changes the dynamics in a significant manner. We observed a modification of the flow agitation, characterized by the liquid velocity variance. Although the decrease of the mean velocity with gas volume fraction is similar to that observed for monodisperse flows (Martínez et. al. 2007), a general increase of the magnitude of fluctuations is observed for certain combinations of bubble size and gas fraction ratios.

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