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Improved flying hot-film anemometry in liquid-gas flows SANTOS MENDEZ-DIAZ, ROBERTO ZENIT, JUAN HERNANDEZ-CORDERO, Instituto de Investigaciones en Materiales, UNAM, REOLOGIA TEAM — A modified hot-film anemometry technique was used to measure liquid velocity fluctuations resulting from bubble agitation in a liquid-gas flow. The first modification aims to remedy the main drawback in hot-film anemometry measurements in liquid-gas flow: bubble-probe interaction. To improve bubble detection, optical fibers were installed in close proximity to the anemometer sensing element; in this way, the collisions of bubbles with the probe can be detected and removed from the signal. The second modification resolves the poor performance of the probe at small mean liquid velocity. The sensing element is moved at a known rate; subsequently, this translation velocity is removed from the signal leaving only the fluctuating velocity of the liquid. Furthermore, an analysis of the effect of the signal processing parameters, such as detection and signal length threshold, is conducted. The flow conditions at which this technique was tested covered void fractions up to 6% in nearly monodispersed bubbly flows. The results obtained show good agreement with reported data by other authors in both, variance and spectral density of the liquid velocity. This technique can be used to measure psuedoturbulence in on bubbly flows.

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