EXPERIMENTAL CHARACTERIZATION OF A MICROBUBBLE INJECTOR

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We have performed a systematic characterization of a novel microchannel bubble injector in conditions relevant to microgravity operation. Bubbles are generated injecting a slug flow created in a capillary T-junction, as seen in Fig. 1. The procedure is robust to changes in gravity level [1]. We address questions regarding the performance under different working regimes. In particular we span a large range of parameters such as gas and liquid injection rates, and capillary diameters. The injection performance in different conditions is characterized by measuring bubble injection frequency and bubble size distribution. Limits of operation performance regarding the control of bubble sizes are evaluated. We compare quantitative results with theoretical scaling laws expected in different regimes.

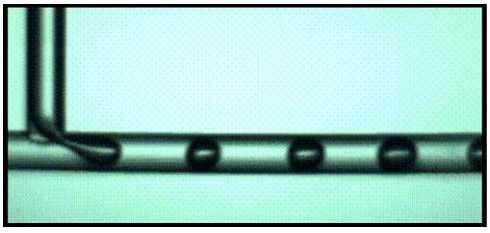

Fig. 1.- Slug flow generated at the T-junction

REFERENCES:

1. J. Carrera, X. Ruiz, L. Ramírez-Piscina, J. Casademunt, M. Dreyer, "Generation of a Monodisperse Microbubble Jet in Microgravity", preprint, 2007.