

## COMPARISON OF TWO METHODS FOR GENERATING SMALL BUBBLES WITH A T-JUNCTION IN MICROGRAVITY CONDITIONS

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In this work we compare the performance of two different methods for generating small bubbles in microgravity related conditions. In both cases a previously reported T-junction bubble generator (formed by two 1mm diameter capillaries), in which liquid and gas are injected perpendicularly, was used to generate two-phase flows. Experiments were performed on ground with an air-water mixture flow. The difference between both methods lies in the way in which the T-junction is fed, being the air and water inlets exchanged (see Fig. 1). In order to characterize the performance provided by both methods several parameters have been compared, such as bubble generation frequency, bubble velocity and void fraction distribution. In addition, the concept of unit cell is used in this work to identify some relevant lengths of the two-phase flow, namely, bubble, liquid slug, and unit cell lengths. All these previous parameters are shown to be predictable on the basis of a single relevant parameter, the mean void fraction or the Strouhal number. The bubble size dispersion obtained for several gas-liquid flow rates is also analyzed, characterizing the optimal operational range of the T-junction for both methods. Finally, a flow pattern map showing the regimes generated in both configurations and the influence of the used methods in the flow pattern transition lines are also presented.



**Fig 1:** example of bubbles being generated with both methods with the same conditions of gas and liquid injection.