

Séminaire du CETHIL

Jeudi 19 novembre 2015 à 13h30

Salle indiquée sur le site web du CETHIL

“Flow Boiling in Heated Tube under Normal Gravity and Microgravity Conditions”

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Résumé du séminaire

Two-phase flows are of great interest for thermal management in both normal and reduced gravity environments. However, the fluid dynamics is strongly affected by the gravity level, which may lead to unpredictable performances for space applications. Therefore, forced convective boiling experiments of HFE-7000 in a vertical heated tube were conducted in order to provide a global description of boiling phenomenon in earth gravity and under microgravity conditions. The experiment that will be presented mainly consists in the study of a two-phase flow inside a 6mm diameter sapphire tube uniformly heated through an ITO coating. Measurements of pressure drops, void fraction, and liquid and wall temperatures are performed, along with flow visualisations. Data were collected in normal gravity and during four parabolic flight campaigns providing near weightlessness conditions. Flow visualisations, temperature and pressure signals are analysed to obtain flow patterns, void fraction, wall and interfacial shear stresses, and heat transfer coefficient data. These experimental results and comparisons with other available datasets are used to attempt a modelling of flow boiling in microgravity.

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