

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Experiments from Sub-Orbital to Orbital Platforms (3)

Author: Dr. David BRUTIN
IUSTI UMR 7343 AMU/CNRS, France, david.brutin@univ-amu.fr

Mr. Florian Carle
Polytech Marseille, France, florian.carle@polytech.univ-mrs.fr

Prof. Qiu-Sheng Liu
Institute of Mechanics, Chinese Academy of Sciences, China, liu@imech.ac.cn

Prof. Jing-Chang Xie
Institute of Mechanics, Chinese Academy of Sciences, China, jcxie@imech.ac.cn

Mr. Gabriel Pont
Centre National d'Etudes Spatiales (CNES), France, gabriel.pont@cnes.fr

Mr. Bernard Zappoli
Centre National d'Etudes Spatiales (CNES), France, bernard.zappoli@cnes.fr

IMPACT - DROP WETTING AND EVAPORATION IN MICROGRAVITY

Abstract

IMPACT which stand for Interface Microgravity Phase Change Heat Transfer is a French-Chinese experiment on-board a Chinese recoverable satellite SJ-10 in 2015/2016.

The purpose of IMPACT is to study the wetting dynamics and the evaporation of water, ethanol and mixture droplets under reduced gravity. Ground based research is performed on the topic by the two teams in France and in China while the experiment hardware development is led by CNES (French Space Agency).

Technically, visible and infrared cameras are used to characterize the droplet geometry and flow motion. The heat flux meter is used to determine the evaporation heat flux absorbed by the droplet during the different stage of the drying. Evaporating droplets are the location of flow instabilities due to thermal effects. In microgravity, these thermal effects are only due to surface tension gradient along the droplet interface and induce the appearance of hydrothermal waves at the droplet interface. In the full paper, we will present the hardware design and the results expected.