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

Author: Mr. Antonio Pugliese
Stevens Institute of Technology, United States, antoniopugliese88@gmail.com

Mr. Wassilis Tzevelecos
Université Libre de Bruxelles, Belgium, wtzevele@ulb.ac.be
Mr. Bruno Alfano
University of Naples "Federico II", Italy, brunoalfano@libero.it
Mr. Valerio Cestrone
University of Naples "Federico II", Italy, valeriocestrone@live.it
Mr. Luigi De Filippis
University of Naples "Federico II", Italy, luigi.defilippis@hotmail.com
Mr. Olivier Desenfans
Université Libre de Bruxelles, Belgium, odesenfa@ulb.ac.be
Mr. Fabrizio Mancino
University of Naples "Federico II", Italy, fabriziomancino@gmail.com
Mr. Santolo Manzone
University of Naples "Federico II", Italy, santolo.manzone@gmail.com
Mr. William Runge
Université Libre de Bruxelles, Belgium, runge@gatech.edu
Mr. Quentin Galand
Université Libre de Bruxelles, Belgium, qgaland@ulb.ac.be
Prof. Stefan Van Vaerenbergh
Université Libre de Bruxelles, Belgium, svanvaer@ulb.ac.be

PRELIMINARY RESULTS FROM A SORET EFFECT EXPERIMENT ONBOARD REXUS 16: CHEMICAL WAVE IN SORET EFFECT (CWIS)

Abstract

The CWIS experiment is scheduled for the REXUS 16 Mission in May 2014. The REXUS/BEXUS programme is realised under a bilateral Agency Agreement between the German Aerospace Centre (DLR) and the Swedish National Space Board (SNSB). The experiment has been performed thanks to the support and cooperation of the Microgravity Research Center of the Université libre de Bruxelles and the Industrial Engineering Department of the Università degli Studi di Napoli Federico II.

The purpose of the CWIS experiment is to visualize the chemical wave due to thermodiffusion in a binary mixture. The chemical wave is a concentration front that rapidly propagates from the thermal boundaries of the liquid mixture, and which marks the beginning of the chemical sorting phenomenon called thermodiffusion, induced by an imposed thermal gradient. The mixture is made up of Ethylene Glycol and Water and the concentration variation is measured using a Fizeau interferometer. The design process of the liquid cell system, which is accommodating the binary mixture, has been shown in the paper IAC2013-A2.3-10x18383 and has led to the geometrical configuration, temperature difference and components concentration used for the experiment.

In this paper, the preliminary results coming from the experiment are going to be shown. Starting

from the refraction index of the mixture, the concentration of each species is going to be evaluated locally and consequently using these results the numerical analysis model is going to be validated.