

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)  
Facilities and Operations of Microgravity Experiments (5)

Author: Mr. Keiichiro Sakagami

Japan Aerospace Exploration Agency (JAXA), Japan, sakagami.keiichiro@jaxa.jp

Dr. Satoshi Matsumoto

Japan Aerospace Exploration Agency (JAXA), Japan, matsumoto.satoshi@jaxa.jp

Mr. Hayato OHKUMA

Japan, ohkuma.hayato@jaxa.jp

COMPREHENSIVE EVALUATION ON ISS CREW WORKING/SLEEPING MICROGRAVITY  
ENVIRONMENT DURING MARANGONI EXPERIMENT IN KIBO

**Abstract**

Since August 2008, we have conducted a series of Marangoni Experiment in International Space Station (ISS)/Japanese Experiment Module (JEM), or Kibo. During Marangoni Experiment, a liquid bridge made of silicone oil is formed between two disks (cooling disk and heating disk) and temperature gradient is imposed between two disks to observe Marangoni convection in Fluid Physics Experiment Facility (FPEF) Experiment Cell, which is accommodated on the Ryutai rack in Kibo.

Because a liquid bridge is very sensitive to g-jitter, science team and operation team cooperate to realize tranquil microgravity environment with crewmembers, for example, to plan this experiment during crew sleeping time with microgravity measurement and we have developed prevention method for liquid bridge breakup.

For more flexible experiment planning, we finally performed Marangoni Experiment during crew working time for the first time in February 2012. We expected a liquid bridge would be broken-up by g-jitter caused by crew motion but intriguingly, the result was different from what was expected.

This result means we may be able to plan Marangoni Experiment even in crew working time if some condition is established. In this paper, this new findings and comprehensive g-jitter evaluation in ISS/Kibo during Marangoni Experiment are presented.