

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Sciences Onboard the International Space Station and Beyond - Part 1 (6)

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NEW TRIAL FOR MARANGONI EXPERIMENT IN KIBO/ISS, CONTINUOUS DAY TIME
EXPERIMENT AND INTENTIONAL BREAKUP TO INVESTIGATE CREW MOTION IMPACT ON
LIQUID BRIDGE

Abstract

In Kibo module, we have conducted series of Marangoni experiment, which is sensitive to g-jitter. Due to its nature of this experiment, to prevent liquid bridge breakup, we plan this experiment only during crew sleeping time and ask crewmember's support not to generate g-jitter even at night. In addition, we monitor liquid bridge status real-timely via downlinked video image, and measure micro-g data for analysis during experiment.

By these efforts, we have never experienced recurrence of liquid bridge breakup which really once occurred during increment 17, 2008. For further investigation, we also tried performing this experiment during crew working period in Feb 2012 for the first time. But unexpectedly, liquid bridge breakup did not occur maybe due to its less volume than usual in developing liquid bridge.

This time, we are trying two new experiments. First, we perform short length liquid bridge experiment during crew working period continuously to investigate g-jitter effect generated by crew motion. Second, we ask crew to push the rack to intentionally cause liquid bridge breakup to investigate how much strength may cause liquid bridge breakup monitoring video image in Kibo.

These results are expected to contribute to extend planning flexibility on microgravity sensitive experiment and to develop more effective preventive method to liquid bridge breakup.