

Abstract Submitted  
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**Transition of Thermocapillary Flow in Low Prandtl Number Liquid Bridge** HIROEI SASAKI, Chiba Institute of Technology, SATOSHI MATSUMOTO, TAKASHI MASHIKO, HIROAKI OHIRA, Japan Aerospace Exploration Agency, ERIKA YODA, Advanced Engineering Services, Co.Ltd, NOBUYUKI IMAISHI, Kyushu University, SHINICHI YODA, Japan Aerospace Exploration Agency — An experimental study of thermocapillary convection in the half-zone liquid bridge of low Prandtl number fluid was performed to observe the transition behavior from steady to oscillatory flows. In thermocapillary convection, one of the still open problems is the observation of onset of oscillatory flow in low Prandtl number fluids. Numerical simulations predicted that there would be two transition points which were a first and second critical Marangoni number ( $Ma_{c1}$  and  $Ma_{c2}$ ). However, an experimental verification has not been performed previously because of its difficulties. A molten tin was used as test fluid and a liquid bridge configuration was employed. The temperature distribution at the interface between the liquid bridge and the cold disk was measured by using several fine thermocouples. It could be experimentally detected that the axisymmetric steady flow changes to three-dimensional steady one with increasing the temperature difference. At higher temperature difference, onset of oscillatory flow was also observed. Experimental results concerning the critical Marangoni numbers agreed very well with numerical simulation.

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