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STUDY ON MARANGONI CONVECTION IN A LARGE SCALE LIQUID BRIDGE ON TG-2 SPACE
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Abstract

Abstract: The floating zone technique is a processing method for high purity crystal growth. The floating zone will generate thermocapillary convection driven by surface tension. When the temperature difference reaches a critical value, the flow in the zone will be unstable, which is called thermocapillary oscillatory convection, and special attention have been paid to the transition from steady to oscillation. This paper studies the flow evolution of a large scale liquid bridge with high Prandtl number in TG-2 space lab. Five thermocouples are used to measure the fluid temperature. The critical temperature difference or the corresponding Marangoni number will tend to vary with the volume ratio, the aspect ratio, heating rate and so on. Besides, we discovered the fluid field transfers from stable state via unstable state to confusion. Traveling wave and standing wave appear when the Marangoni number exceeds the critical value, and the chaos state will follow with higher temperature difference.