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Ultrasonic Measurement of Thermal Convection in Liquid Gallium Layer MASATAKA YOSHIDA, YUJI TASAKA, YASUSHI TAKEDA, Hokkaido University, TAKATOSHI YANAGISAWA, JAMSTEC — Thermal convection appearing in low Prandtl number fluid layer is investigated experimentally. A container, which has 50 mm height, 200 mm width and 50 mm depth, was filled with liquid gallium, which has Prandtl number 0.03. An instantaneous velocity profile in the fluid layer was measured using Ultrasonic Velocity Profiler (UVP), which can be used for opaque fluid such as liquid metal. The results represent a convective flow pattern, rolls arranging along the longer side of the container, and its temporal fluctuation. There are some situations, where 2, 3 or 4 convection rolls appear, on the visualized convective motion. A variation of the number of rolls is shown by spatio-temporal velocity map. Simultaneous measurement using two ultrasonic transducers represent phase delay on temporal fluctuation of the rolls on the axial direction of the roll. Temporal fluctuation of the temperature measured by thermistor at some points in the fluid layer is compared with that of the velocity profiles measured by UVP.

Yuji Tasaka
Hokkaido University

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