## Thermal Steady States of Gases in a Gravitational Field

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This paper presents results on observations of a temperature difference between the top and bottom of a vessel filled with gas in a gravitational field. The observed temperature at the top of the vessel was always lower than the temperature at the bottom of the vessel, and this temperature difference was persistent and steady over more than 20 h. The magnitude of the temperature difference depends on the types of gas molecules present but is independent of the gas pressure in the vessel within the range from  $2.7 \times 10^4$  Pa to 27 Pa. A temperature difference between the top and the bottom is only observed along the vertical direction and is only observed when the vessel contains a gas. These experimental results indicate a gravity effect on molecular heat transfer which enables the transport of energy in the gas without a thermal gradient.

Key words: Gas in Gravitational Field; Effect of Gravity on Gas.