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Science Results from Ground Based Research (4)

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Abstract

The International Space Station (ISS) provides a great opportunity to conduct experiments that can only be achieved there. Therefore, a plenty of experiment has been done utilizing space unique conditions which are intense space radiation, high vacuum at extra vehicle, microgravity and so on. Usually, we are conducting experiments assuming gravity without consciousness. However, in an environment where gravity does not act, it is possible to observe the phenomena more simply and it will be helpful for understanding the true nature. Disappearing the buoyant effect is one of most remarkable in microgravity. The buoyancy convection induced by density difference often appear in materials processing, combustion, and even in cell in life sciences, which means that the fluid physics deeply relates such things. 20 years at NASA, 10 years for JAXA and ESA have passed after starting to utilize the ISS for progress of science and technology. For JAXA, almost 500 experiments have been conducting on the Kibo module since 2008. Experiments on the physical sciences account for 12Surface tension is the characteristic of a liquid in which it forms a layer at its surface so that this surface covers as small an area as possible. For example, in the image below, one can see the coin floating on the surface of the water. Surface tension is the force that keeps the heavier coin from sinking. In general, surface tension becomes stronger with decreasing temperature. A trait of Marangoni convection is a surface tension-driven fluid flow in which the driving force is localized at the only surface. When a temperature difference exists along a surface, the surface is pulled toward a low-temperature region.