

Visualization of turbulence and heat transportation

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Deep water circulation is, in other words, thermohaline circulation. And it influences seawater temperature and salinity. But, the mechanism is not understood in details. Then, we started a research on the mechanism in which seawater in deep layer rise to surface layer gaining heat. We knew a hypothesis saying that the heat is transported by turbulent flow, and the turbulent flow is produced when ebb-and-flow current strikes against seamounts. In our research, we tried unraveling numerically the relationship between thrblent flow and ability of heat transportation. We use three differentdense water: natural seawater, 1.7 % saltwater, freshwater to create three layer in the aquarium. And colored middle one to visualize turbulent flow. We slid 3.6 cm diameter cylinder in the layer to create turbulent flow. We recorded each duration and size in turbulent vortices to consider interrelationship between scale of turbulent vortices and temperature transition.

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