
[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-OS Ocean Sciences & Ocean Environment

[A-OS11]What we have learned about ocean mixing in the last decade

convener: Toshiyuki Hibiya (Department of Earth and Planetary Science, Graduate School of Science, University of Tokyo), Louis St Laurent (Woods Hole Oceanographic Institution), Ren-Chieh Lien (None, 共同), Robin Ann Robertson (China-ASEAN College of Marine Science Xiamen University Malaysia)

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The study of ocean mixing processes has made great strides in development of observation technology over the last decade. This includes the improvement of micro-scale and multi-scale profilers, innovation of ocean gliders, as well as identifying internal waves and turbulence through echo sounding from an underway research vessel. These new technologies enable field observations of ocean mixing processes to extend much deeper and wider than ever before. The accumulated knowledge of the observed features has stimulated theoretical and modeling studies related to ocean mixing processes such as internal wave-wave interactions, internal wave interactions with background shear, and associated energy cascade down to dissipation scales as well as assessment and reformulation of existing turbulent mixing parameterizations to be incorporated into the global circulation and climate models.

This session encompasses a wide variety of coastal and open ocean mixing processes; from the surface through the interior to the near boundary benthic mixing, including the roles of mixing in the biological processes and productivity of the ocean. Through detailed discussions, we would like to confirm how far our understanding of the ocean mixing processes has advanced over the last decade, defining the new frontier of ocean mixing research to be tackled in the next decade.

[AOS11-P15] Frontal mixing processes of the Oyashio and Tsugaru Warm Current in the Northwestern Pacific transition area

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Three major water masses from the Oyashio, Kuroshio, and Tsugaru Warm Current merge in the Northwestern Pacific, resulting in highly variable and complicated oceanographic conditions. In this study, we report preliminary results of our 2017 summer field campaign focusing on mixing processes at the front between the Oyashio and the Tsugaru Warm Current (O-T) by using the R/V *Wakataka-maru* (692t equipped with a shipboard 38 kHz ADCP, a turbulence profiler with a nitrate sensor attached, and Underway-CTD system) and Slocum G2 Glider (equipped with a turbulence sensor, ADCP, CTD and bio-optical sensors). We conducted zigzag surveys with the both platforms crossing the O-T front from the merging area: off the Cape Erimo to the downstream: off Sanriku. The observed hydrographic data indicate multiple intrusions at different layers across the O-T front. We will discuss the mixing processes with the observed turbulence data to reveal the detailed and continuous degenerative processes, which can exchange water properties (heat, salt, nutrients and etc.) between the two water masses.