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

[A-OS15]Dynamics of oceanic and atmospheric waves, vortices, and circulations

convener:Ryo Furue(APL/JAMSTEC), Yuki Tanaka(Graduate School of Science, The University of Tokyo), Yukiharu Hisaki(琉球大学, 共同), Norihiko Sugimoto(Keio University, Department of Physics)
Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Oceanic and atmospheric dynamics aims at abstracting general principles from observed phenomena and constructing a system of mathematical models, thereby leading to the understanding, prediction, and parameterization of those phenomena. It provides perspectives for the advancement of sciences in various areas such as wind waves, swells, internal waves, Rossby waves, equatorial waves, tides, eddies, meandering of jets and fronts, general circulation, boundary layers, and ocean-atmosphere coupled modes. It has also been and will continue to be benefited by new uses of ideas and methods from such theories as resonance, nonlinear interaction, spectral analysis, probability, statistics, and dynamical systems. In this session, we solicit presentations on observational, experimental, numerical, and theoretical studies of oceanic and atmospheric dynamics and on exploratory use of new ideas and methods. We also welcome presentations on new methods of data analysis and on interdisciplinary studies in fields such as climate and environment.

[AOS15-P03]Fine-scale variability of isopycnal salinity in the California Current System

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Keywords:Tracer spectrum, California Current System, Underwater glider

This paper examines the finescale structure and seasonal fluctuations of the isopycnal salinity of the California Current System from 2007 to 2013 using temperature and salinity profiles obtained from a series of underwater glider surveys. The seasonal mean distributions of the spectral power of the isopycnal salinity gradient averaged over submesoscale (12–30 km) and mesoscale (30–60 km) ranges along three survey lines off Monterey Bay, Point Conception, and Dana Point were obtained from 298 transects. The mesoscale and submesoscale variance increased as coastal upwelling caused the isopycnal salinity gradient to steepen. Areas of elevated variance were clearly observed around the salinity front during the summer then spread offshore through the fall and winter. The high finescale variances were observed typically above 25.8 kg m$^{–3}$ and decreased with depth to a minimum at around 25.3 kg m$^{–3}$. The mean spectral slope of the isopycnal salinity gradient with respect to wavenumber was 0.19 ± 0.27 over the horizontal scale of 12–60 km, and 31% to 35% of the spectra had significantly positive slopes. In contrast, the spectral slope over 12–30 km was mostly flat, with mean values of –0.025 ± 0.32. An increase in submesoscale variability accompanying the steepening of the spectral slope was often observed in inshore areas; e.g., off Monterey Bay in winter, where a sharp front developed between the California Current and the California Under Current, and the lower layers of the Southern California Bight, where vigorous interaction between a synoptic current and bottom topography is to be expected.