[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

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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-P10]**The evolution of mode-2 internal solitary waves modulated by background shear currents**

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The evolution process of mode–2 internal solitary waves modulated by the background shear currents was investigated numericallyˌ The mode–2 internal solitary waves were modulated by background shear currents which were set to overlap or offset the wave center¸ and the shear current provided a perturbation state generating forward-propagated long waves and amplitude-modulated wave packet¸ and then the oscillating tail was generated and followed the solitary waveˌ Forward–propagated long waves were robust to the offset and remained mostly unchanged in all casesˌ In contrast¸ oscillating tails and amplitude-modulated wave packet decreased in amplitude with increasing offsetˌ The highest dissipation rate was observed when overlap occurred. In the first 30 periods¸ nearly 36 percents of the total energy lost at an average rate of 9 W m$^{\–1}$¸ it would deplete the energy of the solitary wave in 4.5 h¸ corresponding to a propagation distance of 5 km¸ which is consistent with the hypothesis of *Shroyer et al*. 2010¸ who speculated that the mode–2 internal solitary waves are "short–lived" in the presence of shear currentsˌ