Oceanography Seminar

Yusuke Ushijima

PhD Student
Department of Geophysics
Kyoto University, Japan

“Mixed layer depth and sea surface warming under diurnally cycling surface heat flux in the heating season”

Mixed layer depth (MLD) has large impacts on sea surface temperature (SST), air-sea flux, and large-scale climate. The impacts are large in summer when the small MLD results in large SST response to a given heat flux. Here, the diurnal cycle effects of the surface heat flux on summer MLD and SST, that implied by previous general circulation model studies but have not been quantified, are investigated through large-eddy simulations. The LES results show that the diurnal cycle makes the MLD deeper (shallower) at lower (higher) latitude. The MLD change by the diurnal cycle induces corresponding change in SST-increasing rate. At higher latitude over the North Pacific in June, the SST with the diurnal cycle can become higher by the order of 0.1K than that without the dirunal cycle because of shallower MLD. This might have an impact on longer-scale climate variability.

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