# Intra-seasonal Variations of Upper-Ocean Mixing in Western North Pacific

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Previous studies suggest that the strongest inertial wind power injected into the ocean occurs in the western North Pacific during fall storm inertial wave generation. The energy pathway of these storm-driven inertial waves is not well known. Studies based on mooring observations suggest that only 15-25% of inertial wave energy propagate away from the forcing field as low modes, implying that 75-85% of the inertial wave power dissipated in the nearfield. Deployed in late August 2016, six microstructure EM-APEX floats collected nearly 5-months of measurements of water mass, horizontal current, and turbulence in the Kuroshio-Oyashio confluence. Intra-seasonal variations of turbulent mixing in the surface mixed layer and thermocline are revealed. Preliminary results will be presented. Turbulence kinetic energy dissipation rates, averaged over the upper 120 m, increase from ~5 x $10^{-9}$ W $kg^{-1}$ at the late summer to $10^{-7}$ W $kg^{-1}$ by mid-fall, a factor of 20 enhancement in two months. This enhanced turbulent mixing is correlated with increased inertial wind power from the passage of multiple fall tropical cyclones and lows, elevated upper-ocean inertial wave energy and mixed-layer deepening. Strong near-inertial waves propagate vertically to nearly1000-m depth and last as much as one week after storm passage.

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