Wind-induced mixing in the North Pacific

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Temporal variability of the winter input of wind energy flux (wind power) and its relationship to internal wave fields were examined in the North Pacific. The dominant long-term variability of the wind power input, estimated from the mixed layer slab model, was inferred from an empirical orthogonal function analysis and corresponded to the strength and movement of the Aleutian Low. Responses of the internal wave field to the input of wind power were examined for two winters with a meridional float array along 170˚W at a sampling interval of 2 dbar. Time series of the vertical diffusivities inferred from density profiles were enhanced during autumn and winter. After comparing diffusivities inferred from densities sampling at 2-dbar and 20-dbar intervals, we used Argo floats with a vertical resolution of 20 dbar to detect spatial and temporal variability of storm-related mixing between 700 and 1000 dbar in the North Pacific for 10 years. Horizontal maps of seasonal inferred diffusivities also suggested that the diffusivities were enhanced in autumn and winter. However, it is unlikely that there is a simple linear relationship between the input of wind power and the inferred mixing.

