

What can horizontal stirring tell us about vertical mixing?

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Basin-scale tracer distributions are influenced by horizontal stirring and eddy diffusivity. Eddy diffusivity estimated from Argo temperature and salinity profiles together with ECCO-2 eddy kinetic energy has been updated to include additional years of data, finer horizontal resolution, and a formal error estimate. Assumptions related to vertical mixing inherent in the method for estimating eddy diffusivity are tested. Near the surface, thermohaline structure is influenced by the atmosphere more so than either horizontal stirring or vertical mixing. Locally, vertical mixing is responsible for setting thermohaline structure where large-scale horizontal gradients are weak. The equatorial regions are particularly influenced by these imprints of vertical mixing. Implications for ocean dynamics and numerical modeling are discussed.

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