



Oceanic Interior Mesoscale Turbulence Revealed by ARGO Floats

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By combining the ARGO profiles from the whole database it is possible to estimate the empirical density function of the potential density over most of the World Ocean. This function contains all the information about the statistics of isopycnals at a given place and for a certain period of time (monthly, seasonal or annual). Many interesting quantities can be derived from it: mean density, isopycnal displacement rms, eddy available potential energy (EAPE). This latter quantity is the analog of the eddy kinetic energy (EKE) but for the potential energy reservoir. EAPE is dominated by the expression of mesoscale turbulence and reveals its spatial (horizontal and vertical) structure and magnitude. It shares strong similarities with the surface EKE, the so far sole proxy of mesoscale turbulence, and presents the chief novelty of qualifying the turbulence in the ocean interior from a statistical point of view. Eddy resolving regional and general circulation models would benefit from systematic evaluation against such EAPE fields derived from ARGO.