



Mixing estimates from a large-scale hydrographic survey in the North Atlantic

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A large-scale hydrographic survey from 2003 (RV Meteor cruise M59/2) is used to map turbulent mixing at different depths in the subpolar North Atlantic, covering various hydrographic and bathymetric conditions.

The mixing is studied by means of eddy diffusivities which are estimated with two complementary methods, Thorpe scales and finestructure variances shear and the strain.

Results from the analysis indicate small ($K_\rho \approx O(10^{-5}) \text{ m}^2\text{s}^{-1}$) diffusivities below the Labrador Sea Water layer at mid-depth in the open ocean. Higher values exceeding $10^{-4} \text{ m}^2\text{s}^{-1}$ are found in the abyss close to rough topography and over the flanks of the Mid-Atlantic Ridge. The strongest mixing with diffusivities of $10^{-3} \text{ m}^2\text{s}^{-1}$ occurs in the Deep Western Boundary Current off Flemish Cap.

The results of this study convey the feasibility to map mixing globally from existing data sets to broaden the knowledge of the distribution of eddy diffusivities as a first step towards the incorporation into models.