Vertical eddy diffusivity in the southeast of the North Atlantic

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Different procedures are used to estimate the distribution of the vertical eddy diffusivity coefficient, K_v, in the main pycnocline in the southeast of the North Atlantic from 21-27°N, 14-26°W. Using CTD and ADCP data from two identical hydrographic surveys, one made in September 2002 and the other in June 2003, we calculate the shear of the flow and the Brunt-Väisälä frequency in 30 stations. Then the vertical eddy diffusivity is estimated applying several parameterizations in terms of the gradient Richardson number, Ri, (Pacanowski and Philander, 1981; Peters et al., 1988; Gregg, 1989; Large et al., 1994). In the range of depths from 25 to 648 meters, using Pacanowski and Philander (1981) and Gregg (1986)parameterizations, we obtain maximum values between 10^{-1} and 10^{-3} m^2 s^{-1} in zones of the water column of 20 to 30 m of thickness, having the rest zones values between 10^{-5} to 10^{-8} m^2 s^{-1}. We think that this distribution in patches of high values of K_v into the main pycnocline due to the shear can play an important role in the diapycnal flux of different properties, and not only double diffusion such as other authors have proposed in this oceanic zone.