



On the parameterization of mixing processes at the equator

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Due to reduced wave-wave interaction, mixing in the deeper water column (>200m) of the tropical oceans is considered to be very low. Here, we use full depth microstructure profiles, velocity and stratification measurements from the equatorial Atlantic to assess the skill of two parameterizations at the equator. Average eddy diffusivities rarely exceed $3 \times 10^{-6} \text{m}^2 \text{s}^{-1}$ throughout the deeper water column. However, dissipation rates calculated from internal wave-wave interaction parameterization underestimate observed dissipation rates by a factor of 5 within about 2° of the equator. In this region, the equatorial deep jets are pronounced and elevated dissipation rates are found in the high shear zones of the jets. The role of vertical momentum flux divergence for differences between parameterization and observation is discussed. A turbulence parameterization evaluated in unstable events overestimates dissipation rates directly on the equator but agrees well with observations away ($>1^\circ$) from the equator.