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Poster

A new one-dimensional parameterization of the vertical mixing has been developed for ocean general circulation models (OGCMs) in order to properly represent the diffusive and convective processes in an unified approach. Our approach is inspired from atmospheric parameterizations of shallow convection which assumes that in the convective boundary layer, the subgrid-scale fluxes result from two different mixing scales : small eddies which are represented by an eddy-diffusivity contribution, and large eddies associated with thermals which are represented by a mass-flux contribution. The local (small eddies) and non-local (large eddies) contributions are unified into an Eddy-Diffusivity-Mass-Flux (EDMF) parameterization which treats simultaneously the whole vertical mixing.

EDMF is implemented and tested into the community ocean model NEMO. We will show that the deepening of dense water in 1D analytic cases, successfully reproduced in LES simulations, is significantly better captured with EDMF than with standard diffusion parameterizations because of a better representation of the non-local entrainment fluxes which are counter-gradient in the thermocline.

A preliminary application of EDMF in the tropics will be presented with a focus on PIRATA moorings.

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