



Improvement of NEMO by including non-breaking surface wave-induced vertical mixing

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A parameterized non-breaking surface wave-induced vertical mixing is incorporated into Nucleus for European Modelling of the Ocean (NEMO). Comparisons of several experiments in different horizontal resolution models (ORCA2, ORCA1 and ORCA025) show that non-breaking surface wave-induced vertical mixing can significantly improve the upper-ocean simulation in summer. NEMO always gives too cold subsurface ocean temperature simulations in summer, and it is mainly caused by insufficient vertical mixing during vertical mixing parameterization. The parameterization of non-breaking surface wave-induced vertical mixing can strengthen the vertical mixing significantly in summer, and the subsurface temperature simulation will be improved by this process. The summer mixed layer depth simulation can also be improved significantly. We can get the same results with different horizontal resolution models.