



The temporal residual-mean velocity in the Southern Ocean evaluated using output of an eddy resolving ocean model

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The temporal residual-mean (TRM) velocity, rather than the usual Eulerian time-mean velocity, represents transport of water mass in an eddy-rich ocean. The TRM velocity is the sum of an eddy-induced and the time-mean velocity. It is important to evaluate a vertical component of the TRM velocity to investigate subduction of water masses in an eddy-rich ocean. By using output of an eddy resolving ocean model with 9 km horizontal resolution, the vertical component of the TRM velocity in the Southern Ocean is evaluated. The obtained TRM velocity shows strong downward transport at the Brazil-Malvinas Current confluence. The eddy-induced velocity dominates the TRM velocity. This downward transport seems to explain the injection of low salinity water into the Atlantic subtropical gyre and the formation of the low salinity tongue of Antarctic Intermediate Water in the Atlantic Ocean.