

Role of the vertical mixing in the bottom water warming in a new ocean state estimate using tidally induced mixing parameterization

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Decadal repeat of modern, high-quality, full-depth, hydrographic section observation has revealed the basin-wide warming of the bottom water in the Pacific Ocean, which cannot be neglected for precise estimation of the global heat balance. An ocean state estimate has shown that surface warming around Antarctica can remotely induce bottom water warming in the northern North Pacific through the propagation of internal Kelvin and Rossby waves more quickly than expected from the thermohaline circulation timescale. However, this wave response must depend on the background structures of density and temperature, which are determined by a balance between advection and diffusion. We investigated the bottom water warming in our new ocean state estimate that uses vertical mixing schemes based on well-known tidal energy distribution and discuss the mechanism especially focusing on the role of the vertical mixing.

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