

## Virtual tracer analysis of the Pacific meridional overturning circulation

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We simulate the Pacific meridional overturning circulation (PMOC) by using a realistically configured ocean general circulation model (OGCM). A three-dimensional distribution of turbulent energy dissipation rate derived from a tide model and recent microstructure measurement is employed. A global map of geothermal heating at the seafloor is also incorporated.

The northward volume transport of the Circumpolar Deep Water (CDW) is consistent with mooring observation. The radiocarbon age calculated from the simulated circulation has consistency with observations.

A virtual dye tracer is utilized to investigate the upwelling of deep water and the returning current at the upper deep layer. A virtual particle tracer experiment is also conducted to obtain the fraction of the deep water returning to the Southern Ocean or inflowing to the Indian Ocean.

Keywords: Pacific meridional overturning circulation, Ocean General Circulation Model, particle tracer, tidal mixing, geothermal heat