

Assessment of the effectiveness of the global ocean state estimation using tide-induced mixing parameterizations

*Satoshi Osafune¹, Shuhei Masuda¹, Nozomi Sugiura¹, Doi Toshimasa¹, Tadashi Hemmi¹

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Recent data synthesis experiments showed that adjusting mixing coefficients through data assimilation approach is a promising way to reduce a global misfit between a model simulation and ocean observations, while mixing coefficients should satisfy constraints from energetics. Aiming for a data synthesis experiment that is energetically consistent with the known constraint on the ocean energy budget and can assimilate turbulence observation data, we have developed a new quasi-global four-dimensional variational dataassimilation system using two parameterizations for tidally induced vertical mixing. As a preliminary preparation of the synthesis experiment, we optimally estimated their parameters along with other physical parameters based on the Green' s function method. The simulation using the optimal parameters well reproduces temperature and salinity in the deep Pacific Ocean. Using this simulation as the first guess field, we are conducting a long-term data synthesis experiment. We will present some preliminary results of the synthesis experiment to assess the effectiveness of our new system.

Keywords: vertical mixing, tide, data assimilation