

Global distribution of the ocean vertical diffusivity derived from an ocean tracer inverse model approach

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The ocean vertical diffusivity is important for controlling the distribution of various ocean tracer including the temperature and salinity. Recent studies clarified that its spatial distribution is very inhomogeneous but the global coverage of its direct measurements from turbulent mixing observations are not enough and its quantification is still difficult. On the other hand, recent observational data about the ocean tracer including temperature and salinity are increasing significantly and dataset covering the global ocean is available. The inversion of ocean velocity distribution from ocean tracer has been reported in the previous studies (e.g. Wunsch, 1996). In the same way as this velocity inversion, some studies tried the inversion of the ocean vertical diffusivity (e.g. Ganachaud and Wunsch, 2000) but there are few studies which discuss its detail 3-dimensional distribution. By using an ocean tracer inverse model and an ocean general circulation model, I have tried the inversion of the ocean vertical diffusivity from the ocean tracer observations. In this presentation, I will report my attempt and discuss how observed temperature/salinity distribution is useful for obtaining the 3-dimensional distribution of the ocean vertical diffusivity.

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