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Division of Environment

S E M I N A R

**Analysis of deep-layer and bottom circulations in
the South China Sea based on eight quasi-global ocean model outputs**

by

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Abstract

This study makes a preliminary analysis of South China Sea (SCS) deep circulations using eight quasi-global high-resolution ocean model outputs, in order to assess models' ability to simulate these circulations. Water mass analysis reveals the deviation of deep temperature from WOA01 is negative while salinity deviation in most of models positive which means that simulated deep water is colder and saltier. The relative deviation of model temperature is larger than that of model salinity; moreover, there is a long-term trend in temperature and salinity simulation. The Luzon Strait transport below 1500 m is 0.36 Sv on average for all models, smaller compared with the observation, which is about 2.5 Sv. Assimilated models and unassimilated OCCAM display that the Luzon overflow [ZY1] reaches its minimum in spring and its maximum in winter. The vertically integrated streamfunctions below 2400 m in these models show a deep cyclonic circulation in the SCS on a large scale, but the pattern is different compared to the diagnostic streamfunction from GDEMv3.[ZY2] The meridional overturning structure above 1000 m is similar in all models, but the spatial distribution and intensity below 1500 m are quite different from model to model.

Moreover, the meridional overturning below 2400 m in these models is weaker than that of the GDEMv3, which indicates deep vertical mixing process in the model is biased weak. Based on the above evaluation, this paper discusses the impacts of thermohaline initialization, topography, and mixing scheme on the SCS deep circulation, which provides a reference for future model improvement.

Key Words: quasi-global ocean model; deep-layer and bottom SCS circulation; model evaluation.

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~ All are welcome ~