

Progress on deep meridional overturning circulation in the South China Sea

December 6 2016

The MOC is the meridional-vertical circulation that affects redistribution of energy and global materials like fresh water, carbon, etc. Related studies show that MOC has strong implications for the long-term variation of ENSO, the position of the Intertropical Convergence Zone and the marine ecosystem, and further impacts long-term climate change. Deep SCS MOC is a good indication of the characteristics of deep circulation and is closely related to the freshwater and heat balance, and the sediment transport.

Science China Earth Sciences published a review paper of Dr. Dongxiao Wang (the first author) and Dr. Qiang Xie (corresponding author) in Volume 59 (in English version), which summarized the progress on SCS MOC of Dongxiao Wang's group and other researchers.

The deep SCS horizontally cyclonic circulation is mainly controlled by the downwelling branch of the MOC (Luzon Strait overflow). Mixing caused by tides and eddies further enhanced the cyclonic circulation. Because of the conservation of potential vorticity, the SCS MOC drives an anticyclonic circulation anomaly. The anomalous anticyclonic circulation overlapping on the upper horizontal circulation weakens (strengthens) the western boundary current (WBC) in winter (summer).

The SCS MOC presents an unclosed "sandwich" structure. Upwelling areas of the MOC are mainly located in the slope and three northwest-southeast tilted zones. One possible mechanism for the upwelling areas is the interaction between topography Rossby waves (TRWs) and westward

planetary Rossby waves. Moreover, the TRWs are confirmed in the southern SCS by a five-year mooring observation.

This paper reviewed the roles of Luzon Strait overflow and complex topography in SCS deep [circulation](#) and deep MOC, which might provide insightful ideas for the related fields.

More information: D. Wang, J. Xiao, Y. Shu, Q. Xie*, J. Chen, Q. Wang, Progress on deep circulation and meridional overturning circulation in the South China Sea. Science China, 59: 1827-1833.

Provided by Science China Press

Citation: Progress on deep meridional overturning circulation in the South China Sea (2016, December 6) retrieved 7 May 2024 from <https://phys.org/news/2016-12-deep-meridional-overturning-circulation-south.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.