

EGU2020-4670

<https://doi.org/10.5194/egusphere-egu2020-4670>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



Variability of the Subantarctic Mode Water volume in the South Indian Ocean during 2004-2018

Yu Hong^{1,2}, Yan Du^{1,2,3}, Tangdong Qu⁴, and Wenju Cai^{5,6}

¹South China Sea Institute of Oceanology, China (hongyu@scsio.ac.cn)

²Southern Marine Science and Engineering Guangdong Laboratory (Guangzhou), Guangzhou, China

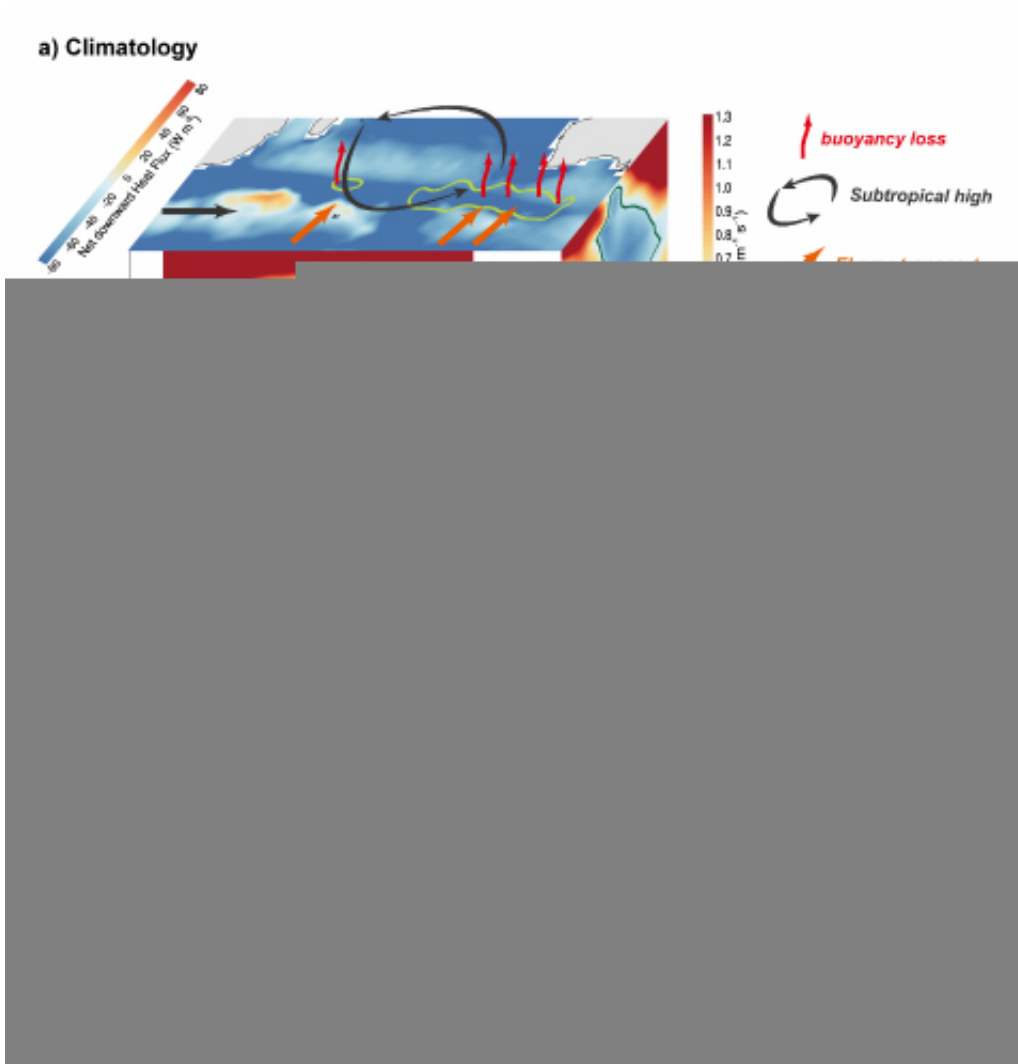
³University of Chinese Academy of Sciences, Beijing, China

⁴Joint Institute for Regional Earth System Science and Engineering, University of California, Los Angeles, CA, 90095, USA.

⁵Centre for Southern Hemisphere Oceans Research (CSHOR), CSIRO Oceans and Atmosphere, Hobart 7004, Tasmania, Australia

⁶Key Laboratory of Physical Oceanography, Institute for Advanced Ocean Studies, Ocean University of China and Qingdao National Laboratory for Marine Science and Technology, Qingdao, China.

Analysis of the Argo data reveals that the Subantarctic Mode Water (SAMW) in the South Indian Ocean, characterized by a vertical potential vorticity minimum, decreases by 10% in volume from 2004 to 2015. Most of this volume decrease occurs in the density range 26.8-26.9 kg m⁻³ which forms southwest of Australia, while a slight volume increase occurs in 26.6-26.8 kg m⁻³. Further analysis of the data indicates that a reduction of subtropical high and westerly winds in the South Indian Ocean weakens (intensifies) the E-P, heat loss, Ekman pumping and shoals (deepens) the mixed layer southwest of Australia (west of 90°E), which leads the decrease in 26.8-26.9 kg m⁻³ (increase in 26.6-26.8 kg m⁻³) by 3 years (see the figure below). This result suggests that the subtropical wind system variation plays an important role in the volume variation of SAMW in the South Indian Ocean in the Argo period.



How to cite: Hong, Y., Du, Y., Qu, T., and Cai, W.: Variability of the Subantarctic Mode Water volume in the South Indian Ocean during 2004-2018, EGU General Assembly 2020, Online, 4-8 May 2020, EGU2020-4670, <https://doi.org/10.5194/egusphere-egu2020-4670>, 2020