Supplemental Material

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Supplemental Material

Vertical Structure of the Upper Indian Ocean Thermal Variability

Yuanlong Li$^{1,2,3,4}$, Weiqing Han$^5$, Fan Wang$^{1,2,3}$, Lei Zhang$^5$, Jing Duan$^{1,2,3}$

$^1$CAS Key Laboratory of Ocean Circulation and Waves, Institute of Oceanology, Chinese Academy of Sciences, Qingdao, China
$^2$Function Laboratory for Ocean Dynamics and Climate, Qingdao National Laboratory for Marine Science and Technology, Qingdao, China
$^3$Center for Ocean Mega-Science, Chinese Academy of Sciences, Qingdao, China
$^4$CAS Center for Excellence in Quaternary Science and Global Change, Xi'an, China
$^5$Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder, Colorado, US

**Corresponding Author:**
Yuanlong Li  
Key Laboratory of Ocean Circulation and Waves, Institute of Oceanology, Chinese Academy of Sciences, Qingdao 266071, China.

Email: liyuanlong@qdio.ac.cn
Fig. S1. (a) 6-year low-pass filtered IO basin-mean temperature profile, (b) unfiltered temperature profiles of the south IO and (c) the north IO derived from ensemble-mean observation. (d)-(f) are the same as (a)-(c) but from HYCOM MR. Ensemble-mean observation is the average of WOA, IAP, and EN4. Solid contours highlight 0 values, and dashed contours are ±0.1, ±0.2, ±0.3, ±0.4 K.
Fig. S2. The leading two EOF modes of the IO basin-mean temperature from (a) WOA, (b) IAP, and (c) EN4.
Fig. S3. (a) The upper-layer OHC (0-400 m) of the IO from WOA, IAP and EN4 and EOF mode 1. (b) The IO basin-mean SST based on HadISST data and EOF mode 1. The 6-year low-pass filtered time series are plotted as thick curves. (c) The IO basin-mean SST based on HadISST data and EOF mode 2. EOF modes are derived from the ensemble-mean observational data.
Fig. S4. SST anomalies (K) regressed onto the 6-year running trend of the 0-400 m OHC of MR. SST anomalies are derived from (a) MR, (b) PAC, and (c) TAU. Stippling indicates insignificant coefficients below 95% confidence level.
Fig. S5. Regression maps of (a) $T_1$ (0-60 m average), (b) $T_2$ (60-400 m average), and (c) SST of MR onto Nino-3.4 index. Stippling indicates insignificant coefficients below 95% confidence level. (d)-(f) are the same as (a)-(c) but regressed onto DMI.
Fig. S6. Regression maps of (a) $Q_T$, (b) SWR, and (c) 10-m winds (vectors) and wind speed (color shading) and (d) total cloud cover onto Nino-3.4 index. Stippling indicates insignificant coefficients below 95% confidence level. (e)-(h) are the same as (a)-(d) but regressed onto DMI.
Fig. S7. (a) 6-year low-pass filtered SST anomalies of the tropical IO (30°-120°E, 25°S-25°N) and the Inter-basin SST gradient ΔSST (tropical IO minus tropical Pacific; tropical Pacific is defined as 160°E-100°W, 25°S-25°N), compared with 6-year low-passed Mode 1. (b) 6-year low-passed 10-m zonal wind ($u_{10}$) of the western and central tropical Pacific (140°E-140°W, 20°S-20°N) and ITF heat transport, compared with 6-year low-passed ΔSST.