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Comparison of Seasonal Heat Transport in the Northern Indian Ocean Between Assimilation Data and a General Circulation Model

FANGHUA WU[1], WEI LI[1], HAILONG LIU[1], XUEHONG ZHANG[1]
[1] *LASG, Institute of Atmospheric Physics, Chinese of Academy Sciences*

Monsoon of the Northern Indian Ocean (NIO, north of 5S) gives rise to complex circulation and heat transport in much of this region. The variability in the meridional overturning and heat transport of the NIO estimated by assimilation data and LICOM (LASG/IAP Climate System Ocean Model, with a uniform grid of 0.5deg× 0.5deg, Liu et al., 2004) are examined. Two latest assimilation data, GODAS (Global Ocean Data Assimilation System, Behringer and Xue, 2004) and SODA1.2 (Simple Ocean Data Assimilation), are selected. Forced by wind stresses from ERA15, a 10-yr integration of LICOM is conducted with sea surface temperature and salinity being restored to the Levitus 98 datasets. Temperature structure and large-scale circulation in the NIO can be well reproduced in LICOM. Heat transport from three data displays a strong seasonal cycle, which is northward in northern winter and southward in northern summer. However, similarly to most of numerical simulation results, meridional heat transport deduced from LICOM is somewhat smaller than estimates from GODAS and SODA, especially in the boreal summer. Annual mean cross-equatorial heat transport of LICOM is only half those of assimilation data. That Circulation simulated by LICOM is less strong to induce intensity difference of meridional overturning is major reason. Vertical temperature difference between LICOM and assimilation data is another reason.