Inter-comparison of ocean heat content variability from climate models simulation

Yuanling Zhang[†]; Xianyao Chen
[†] The First Institute of Oceanography, SOA, China, People's Republic of
Leading author: zhangyl@fio.org.cn

The ocean has enormous heat capacity and thermal inertia to help maintain climate variability, and plays a central role in moderating climate change. Therefore the ocean heat content (OHC) could be examined as a constraint to evaluate the climate model simulations. Based on the observation records from the World Ocean Atlas (WOA09) and ISHII6.2 datasets, and CMIP5/IPCC climate model products, the variability of the OHC on the seasonal, interannual, and decadal time scales are obtained using the Empirical Mode Decomposition method. Through the comparison between the simulated and observed OHC on each time scales, we could identify the reliability of a particular model. The results show that while most models captured the major characteristics in the upper ocean, the OHC variability of observations in the 300-700m depth could hardly be reproduced. This is probably attributed to the sparse observations in the deep ocean and the models' deficiency on the vertical transportation.