



The Influence of Ocean Dynamics on the Tropical Atlantic SST Bias in CESM1

Zhenya Song (1,2,3), Sang-Ki Lee (2,3), Chunzai Wang (3), Ben Kirtman (4), and Fangli Qiao (1)

(1) First Institute of Oceanography, SOA, China, Qingdao, China (songroy@fio.org.cn), (2) Cooperative Institute for Marine and Atmospheric Studies, University of Miami, Miami FL, (3) Atlantic Oceanographic and Meteorological Laboratory, NOAA, Miami FL, (4) Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, Miami, Florida

In order to identify and quantify inherent errors in the atmosphere-land model and the ocean-sea ice model components of the Community Earth System Model version 1 (CESM1), and their contributions to the tropical Atlantic sea surface temperature (SST) bias in CESM1, we propose a new method of diagnosis and apply it to a series of CESM1 simulations. Our analysis of the model simulations indicates that the ocean-sea ice model contributes significantly to the eastern equatorial Atlantic warm SST bias in CESM1 due to its inherent errors in ocean dynamic processes. Therefore, while we acknowledge the potential importance of the westerly wind bias in the western equatorial Atlantic and the low-level stratus cloud bias in the southeastern tropical Atlantic, both of which originate from the atmosphere-land model, we emphasize here that solving those problems in the atmosphere-land model alone does not resolve the equatorial Atlantic warm bias in CESM1.