



Can high-resolution GCMs unravel Indian Ocean - ENSO interaction?

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Analysis of observations shows that the western pole of the Indian Ocean Dipole (IOD) can act as a precursor to El Niño/Southern Oscillation (ENSO) at over 15 months lead time while the eastern pole does not. However, the underlying mechanisms are still highly controversial. Will simulations with high resolution GCMs provide new insights?

In this contribution, we will present the analysis of a 100 year high-resolution simulation with a global high-resolution (10 km ocean, 50 km atmosphere) version of the Community Earth System Model (CESM). In many ways, the simulation results of ENSO improve compared to those with the CMIP5 resolution of CESM. The results indicate that IODEast has more influence on the Pacific Ocean than IODwest, contradicting the observation-based analysis.

This discrepancy seems to be related to an overly strong sea surface temperature variability in the East Indian Ocean – a common bias in GCMs. Further analysis of this bias leads to suggestions for model improvements.