



## **Interannual simulation of tropical oceans during 1958-2014 using a high resolution OGCM**

Goro Yamanaka, Hiroyuki Tsujino, Hideyuki Nakano, Shogo Urakawa, and Kei Sakamoto  
Meteorological Research Institute, Tsukuba, Japan

We develop a high-resolution tropical ocean model (0.2 deg. x 0.1 deg.) nested to a low-resolution global domain model (1 deg. x 0.5 deg.). We use a two-way nesting approach which allows for communication between the global model and the nest in both directions. A comparison between the high and low-resolution models is made to examine the impact of horizontal resolution on tropical ocean simulations. The long-term mean simulated Indonesian Throughflow transport in the higher-resolution model (13.1 Sv) agrees well with the observed estimate (about 15 Sv). The higher-resolution model permits more enhanced representation of Equatorial Upwelling and horizontal current shear north of the equator. Tropical instability waves (TIWs) in the equatorial Pacific and Atlantic Oceans are more clearly resolved in the higher-resolution model with larger amplitudes. TIWs enhance meridional heat exchange in the eastern tropical Pacific, which results in relative SST warming north of the equator, while enhanced upwelling in the high-resolution model results in relative SST cooling at the equator and along the South American coast. This means that the high-resolution model further strengthens the north-south asymmetry of the mean equatorial Pacific SSTs.