



## **Long-term Numerical Simulation of the Indonesian Throughflow**

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The Indonesian throughflow (ITF) as a part of the global conveyor belt plays an important role within the worldwide water exchange. It is the only low-latitude connection between oceans on the world with a varying transport of water mass and heat from the warm pool in the tropical western Pacific Ocean through the topographically very complicated Indonesian seas into the Indian Ocean. It is also interacting with the regional weather and climate and probably with the El Nino Southern Oscillation (ENSO) as well as the Indian Ocean Dipole (IOD).

A nested numerical model system has been set up to realistically simulate more than 30 years of the Indonesian Throughflow. A global circulation model delivered the boundary values for the water level, the temperature and salinity distribution to a local model covering the region of the Indonesian throughflow. Both models were forced with NCEP data.

Results of the regional model are in good agreement with measured data regarding velocity distribution, stratification as well as transported water masses. Model results show a highly variable and very complex current system. The strong jet in the Makassar Strait, which has been simulated in correspondence to measurements, can be visualized in its full extension and variability including the regions of its origin.

The presence of a realistic throughflow has been simulated even without a barotropic pressure gradient directed from the Pacific towards the Indian Ocean. Furthermore, model results indicate that the seasonal wind system plays – on the average – a rather blocking role on the ITF.