



## **The importance of the South Atlantic high pressure system for the Tropical Atlantic annual cycle: experiments with a regionally coupled model**

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Conditions in the Tropical Atlantic (TA) are important for the climate in many regions. Because of this, it is important to simulate accurately the seasonal and interannual variability in this region. Currently, most of the coupled models suffer from serious biases in the TA. Identifying the causes of these biases is an important issue. Using a high-resolution fully coupled ocean–atmosphere regional model MPIOM- REMO (ROM) we explore the importance of the South Atlantic high pressure (SAH) for the simulated TA variability. In ROM a global ocean model with regionally high horizontal resolution is coupled to an atmospheric regional model and global terrestrial hydrology. The coupling is active in the region covered by REMO, whereas in the rest of the ocean its circulation is driven by prescribed atmospheric forcing without any feedbacks.

Here we analyze two set of simulations that differ by the coupled area. In one of the setups, the atmospheric model domain includes the SAH, whereas in the second, the SAH is outside the region of active coupling. The first setup shows a much reduced warm bias in sea surface temperature (SST) in the warm pool and in the Angola-Bengela front. We analyze the contribution of the ocean and the atmosphere to these differences