



## **Role of tropical Indian and Atlantic Oceans variability on ENSO**

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There are strong evidences of an interaction between tropical Indian, Atlantic and Pacific Oceans. Nevertheless, these interactions remain deeply controversial. While some authors claim the tropical Indian and Atlantic oceans only play a passive role with respect to ENSO, others suggest a driving role for these two basins on ENSO. The mechanisms underlying these relations are not fully understood and, in the Indian Ocean, the possible role of both modes of tropical variability (the Indian Ocean Dipole (IOD) and the Indian Ocean Basin mode (IOB)) remain unclear. To better quantify and understand how the variability of the tropical Indian and Atlantic Oceans impact ENSO variability, we performed two sensitivity experiments using the SINTEX-F2 coupled model. For each experiment, we suppressed the variability of SST and the air-sea coupling in either the tropical Indian Ocean or tropical Atlantic Ocean by applying a strong nudging of the SST to the observed SST climatology. In both experiments, the ENSO periodicity increases. In the Atlantic experiment, our understanding of this increased periodicity is drastically limited by the strongly biased mean state in this region. Conversely, in the Indian Ocean experiment, the increase of ENSO periodicity is related to the absence of the IOB following the El Niño peak, which leads to a decrease of westerly winds in the western Pacific during late winter and spring after the peak. These weaker westerlies hinders the transition to a La Niña phase and thus increase the duration and periodicity of the event.