



Response of Tropical Atlantic Variability to a reduction of the Meridional Overturning Circulation

R. Haarsma (1), W. Hazeleger (1)

(1) Royal Netherlands Meteorological Institute (KNMI)

The northward ocean heat transport in the Atlantic is dominated by a basin-wide meridional overturning circulation (MOC). The inflow of MOC water into the tropical Atlantic occurs via the South Equatorial Current and the North Brazil Current. Some of that water upwells into the surface layer, potentially affecting coupled ocean-atmosphere variability. Tropical Atlantic Variability is dominated by a zonal equatorial mode and an interhemispheric mode. In the presentation the tropical Atlantic climate with and without a strong Atlantic MOC will be discussed in detail. We will show results of the coupled SPEEDO model, that simulates tropical Atlantic variability realistically, in which the inflow of the MOC in the Atlantic basin has been artificially reduced. In response, the well-known interhemispheric gradient in surface temperature develops and the ITCZ shifts southward. These changes are characteristic of the Atlantic Multidecadal Oscillation. Also, upwelling on the equator reduces and characteristics of Tropical Atlantic Variability change. In particular, a deeper equatorial thermocline causes the zonal mode of interannual variability to reduce and Benguela Nino's to become more pronounced.