



Response of Atlantic ITCZ to changes in strength of oceanic overturning circulation and under global warming

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Meridional shifts in the position of the intertropical convergence zone (ITCZ) occur in various modeling studies of past and future climate change. Paleoclimate records indicate that these shifts have been synchronous to abrupt changes in the temperature of the North Atlantic region related to changes in the Atlantic meridional overturning circulation (MOC).

A large number of quasi-equilibrium runs with different MOC strengths have been performed with Climber-3 α , a coupled global climate model of intermediate complexity. These runs allow the systematic study of the influence of the MOC on the ITCZ.

For varying MOC strength changes in the position of the ITCZ are observed. For strong MOC the maximum of precipitation in the ITCZ is located further north than for weak overturning.

Furthermore, the influence of global warming on the ITCZ is studied with the help of several long-term future CO₂ scenario runs. The direct effect of global warming is an intensification of precipitation in the ITCZ. The indirect effect due to a reduction of the MOC is identified with a series of sensitivity experiments.