



Precipitation regimes in an aquaplanet general circulation model

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The Atmospheric General Circulation Model ARPEGE-Climat is used in an aquaplanet configuration to study the response of a zonally symmetric atmosphere to a range of Sea Surface Temperature (SST) forcing. We impose zonally-symmetric SST distributions that are also symmetric about the equator, with varying flatness at the equator.

We obtain the characteristic “Inter-Tropical Convergence Zone (ITCZ) splitting” that separates two regimes of equilibrium (in terms of precipitations): one with one ITCZ over the equator for large SST gradients in the tropics, and one with a double ITCZ for small tropical SST gradients. We explore the sensitivity of the ITCZ splitting to the parameters of the model’s convection scheme, and untangle the mechanisms at play in this transition.