Stochastic data adapted Atlantic Meridional Overturning Circulation box models

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Above Left: A map of the current of the AMOC in the ‘on’ state, with the box boundaries drawn on. The AMOC is able to tip into a different stable state known as the ‘off state’ where the current is reversed (in this model).

Bifurcation Tipping with a top-hat hosing function

Rate-dependent tipping with a small change in $T_{fall}$

Top Right: A schematic of the five box model, details in Wood et al. (2019). S- Southern Ocean, T- Tropical Thermocline, N- Northern Atlantic, IP- Indo-Pacific Ocean, B- Bottom Waters. Eta is a mixing parameter, $q$ is the strength of the circulation, K are wind fluxes and F are freshwater fluxes.

Left: Noise induced tipping with hosing and variable noise amplitudes (estimated from FAMOUS runs)