

Characteristics and variability of the Atlantic meridional overturning circulation in the RAPIT climate model ensemble

Adam Blaker (1), Daniel Williamson (2), Peter Challenor (3,1)

(1) National Oceanography Centre, UK (atb299@noc.ac.uk)

(2) Durham University, UK

(3) Exeter University, UK

We present some results from the RAPIT ensemble of the UK Met Office coupled climate model HadCM3. The ensemble is being run through climateprediction.net (CPDN), and there is now around 5 million years of model output freely available to analyse.

Plots of the time evolution of the Atlantic meridional overturning circulation (AMOC) from a 10,000 member perturbed physics ensemble display some interesting characteristics. Most obviously, the plume is distinctly asymmetric. The upper bound is defined by a rapid spinup which peaks after around 15 years, followed by a similarly fast spindown. A second, less rapid peak occurs at around 60 years, after which the upper bound gradually decreases, tending towards a stable state around 28 Sv. In contrast, the lower bound displays no rapid minima, instead showing a gradual decrease, tending towards a stable state around 2 Sv. We identify the cause of the peaks which define the upper bound of the AMOC as an artificial excitation of known mechanisms of AMOC variability identified in HadCM3, synchronously excited by the parameter changes applied.