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# Atlantic Multidecadal Variability in a multi-model ensemble of multi-century climate simulations

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Low-frequency climate variability occurring over multidecadal timescales and its mechanisms are poorly understood: the shortness of the observational record does not make allowance for enough completed variation cycles of climate variables to be detected, and proxy data often remain limited to the proxy sites and they are also potentially limited in their ability to represent climatic variations over a range of different timescales. Therefore it represents a scientific challenge.
Moreover in order to properly assess the impact of external forcings on the observed climatic changes, it is essential to understand the background natural climate variability so as to better disentangle the relative contribution of anthropogenic and natural drivers of climate variability.
The low-frequency behaviour of the Atlantic Multi-decadal Variability (AMV) is examined in a set of multi-century CMIP5 pre-industrial climate simulations performed using different Coupled General Circulation Models (CGCMs).
The analysis of long multi-century integrations under constant radiative forcing conditions, allows the study of the internal (non anthropogenic) variability in the Atlantic domain, over inter-decadal and centennial timescales.
The non-stationarity as well as the low-frequency changes in the teleconnection patterns of the modelled AMV are investigated. Also, the relationship between the detected low-frequency changes in the AMV behaviour and the variability of the large scale ocean circulation (Atlantic meridional overturning circulation; AMOC) will be inspected.
Data are collected from the longest (minimum 500-years long) pre-industrial simulations from the CMIP5 archive.
A multi-model analysis of the Atlantic Multidecadal Variability (AMV) allow us to investigate similarities and differences across a large ensemble of state-of-the-art climate models and to identify the prominent simulated mechanisms of air-sea interaction at mid-latitude and over decadal and longer time scales.
Aim of this study is to investigate the processes driving the non-stationarity exhibited by the long-term AMV evolution as represented by a large number of dynamical models, with particular emphasis on the large-scale changes in the teleconnection pattern associated with this climate index.
Coordinated changes in surface air temperature, precipitation and Atlantic MOC corresponding to regime shift in the AMV will be analysed.
The expectation of this analysis is to gain further insight into the AMV variability with the ultimate goal of better constraining its future evolution.