NAO-Ocean Circulation Interactions in a Coupled General Circulation Model.

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In the present study, an oscillatory mode in the North Altantic sector of the INGV/CMCC coupled general circulation model (Gualdi et al. 2006) with a typical subdecadal timescale is examined in detail. The oscillation involves coordinated changes in SST and atmospheric circulation, with a typical North Atlantic Oscillation (NAO)-like structure.
The interplay between mid-to-high latitude SST, ocean circulation variability and the NAO is analysed. A major focus of this study is the role of ocean circulation on the NAO variability, with specific attention on the barotropic wind-driven component. In particular, the role of the Inter-Gyre Gyre (IGG; Marshall et al. 2001; hereafter M01) as a heat carrier, and its impact on the low frequency modulation of the North Atlantic SST tripole is investigated. A mechanism governing the oscillation is identified, bearing strong similarities with the mid-latitude *delayed oscillator* paradigm. An estimate of the essential parameters governing the oscillation in the coupled model within the frame of the simplified M01 conceptual model is also presented. In particular, the strength of the SST/NAO feedback (f), the IGG heat transport efficiency (g) and the damping of SST anomalies by air-sea interaction (lambda) are evaluated. This will enable to determine the R = fg/lambda factor, controlling the coupling strength of the system.