



Forced and unforced variability of the ocean heat content in millennial simulations with the ECHO-g atmosphere-ocean General Circulation Model

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This work analyses the ocean heat content (OHC) described by one 1000-yr long control simulation, two forced simulations of the last millennium and two IPCC scenario simulations (A2 and B2), performed with the ECHO-G atmosphere-ocean General Circulation Model (AOGCM). Since the deepest layers of the ocean are unstable, the heat content is integrated in the upper ocean. The forced experiments show a clear response to the external forcing at high and low-frequencies. A common result in all the simulations is that interannual variability of the OHC is found to be higher close to the Equator, while the largest changes at interdecadal and secular timescales occur in the tropics. However, the amplitude of oscillations is considerably higher in the forced runs. In contrast with observations, our simulations exhibit the largest OHC changes in the Pacific basin, and the smallest in the Indian ocean.