Short model description

ECBILT-CLIO-VECODE is a three-dimensional Earth system model of intermediate complexity (Renssen *et al.*, 2005; Goosse *et al.*, 2005). The atmospheric component is ECBILT2 (Opsteegh *et al.*, 1998), a T21, L3 quasi-geostrophic model with simple parameterizations for diabatic heating processes. The oceanic component is CLIO3 (Deleersnijder and Campin, 1995; Fichefet and Morales Maqueda, 1997; Goosse and Fichefet, 1999), which is made up of a $3° \times 3°$, L20 ocean general circulation model coupled to a comprehensive thermodynamic-dynamic sea ice model. ECBILT-CLIO is coupled to VECODE, a global vegetation model that simulates the dynamics of two main terrestrial plant functional types (trees and grass) as well as desert (Brovkin *et al.*, 1997, 2002). Further information on the model and a complete list of references is available at

http://www.knmi.nl/onderzk/CKO/ecbilt.html

and at

http://www.astr.ucl.ac.be/index.php?page=CLIO%40Description

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Description of experiments

OAV

The fully coupled model has been used to simulate the climate of preindustrial times (PMIP2_0K_OAV) and of the mid-Holocene (PMIP2_6K_OAV) following the MOTIF protocol.

PMIP2_0K_OAV ECBILT-CLIO-VECODE has been forced with the orbital configuration and the greenhouse gas concentrations recommended by the MOTIF protocol (25 DU for O_3). The model has been initialised with a preindustrial equilibrium including greenhouse gas concentrations slightly different from the one requested by MOTIF. Our 0K_OAV-simulation has been integrated long enough for any trends to be small (4000 years) and only the last 100 years have been used for analysis and the MOTIF database.

PMIP2_6K_OAV For our mid-Holocene experiments we have also adopted the recommendations of the MOTIF protocol, i.e. the orbital parameters

and CH_4 concentration have been adapted. As for 0K_OAV, the model has been initialised with a preindustrial equilibrium including greenhouse gas concentrations slightly different from the one requested by PMIP2. We have integrated the model for 4000 years so that any trends are sufficiently small. The last 100 years of model output have been used for our analysis and the MOTIF database.

OA

In those simulations, we have used ECBILT-CLIO without VECODE.

PMIP2_0K_OA   Same experimental design as PMIP2_0K_OAV.

PMIP2_6K_OA   Same experimental design as PMIP2_6K_OAV.