



Investigating vegetation-climate interactions during glacial times using the IPSL GCM

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Vegetation plays an important role in the climate system, through its impact on albedo, rugosity and water fluxes. Only few GCM studies have investigated the climatic impact of vegetation changes in glacial times, some using a fixed glacial vegetation based on pollen reconstructions (e.g. Crowley & Baum 1997; Wyputka & McAvaney 2001) and some others using vegetation models (Kubatzki & Claussen 1998; Levis & Foley 1999; Crucifix & Hewitt 2005), but seldom with a full atmosphere-vegetation coupling. Moreover, most of these simulations have been run with fixed sea surface temperatures, thus inhibiting potential oceanic retroactions. Here we force two different vegetation models, ORCHIDEE and BIOME4, with outputs from the IPSL_CM4 Atmosphere-Ocean General Circulation Model (AOGCM). Two different glacial climates are used: with and without collapsed Atlantic Meridional Overturning Circulation (AMOC). The state with a collapsed AMOC results from an imposed additional freshwater flux in the North Atlantic ocean. Then, the different resulting vegetations are used to force the AOGCM. The new climatic states are compared with data and with results from other simulations performed in the PMIP2 project. If time allows we will also show the results from a fully coupled glacial simulation IPSL_CM4-ORCHIDEE and compare the results to those obtained in forced mode.