

Interactive comment on “Sensitivity of interglacial Greenland temperature and $\delta^{18}O$ to orbital and CO_2 forcing: climate simulations and ice core data” by V. Masson-Delmotte et al.

V. Masson-Delmotte et al.

valerie.masson@cea.fr

Received and published: 2 September 2011

We thank the reviewers and editor for their constructive comments. We have revised our manuscript to include all their suggestions.

Response to the comments of referee 1 The text now includes the following statement : “Modern observations suggest larger summer than winter precipitation in central Greenland (Shuman, 1995), which differs from deposition seasonality in Antarctica (Laepple et al., 2011).” (section 2.1, deposition effects). The observations from Summit

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



therefore support the control run results. The aspect of model validation will be further analysed in another multi-model publication (Sime et al, in preparation). We have also added, in the conclusions : “Such analysis could be also expanded to Antarctica, where modern observations and modeling has suggested significant intermittency effects, with different seasonal biases than for Greenland(Laepfle et al., 2011; Sime et al., 2009) and the cause for the ice core $\delta^{18}O$ optimum remains debated (Holden et al., 2010; Laepfle et al., 2011; Masson-Delmotte et al., 2010c).” The minor comments have been taken into account, including a revised paper title.

Response to the comments of referee 2 The specific comments have been taken into account and new information has been added in the text and tables : 1. The duration of snapshot simulations has been introduced in section 3.1.

2. The tests done to verify the equilibrium of the atmosphere and land reservoirs in the isotopic simulation are now described at the end of section 4.1.

3. The equilibrium of the freshwater flux experiment has been discussed in section 3.1.

4. The atmospheric composition during the last interglacial is very similar to the pre-industrial. Between 128 and 115 ka, the CO₂ concentration (from Vostok and EDC ice cores) varies between 273 and 276 ppmv (see the PMIP3 wiki <http://pmip3.lsce.ipsl.fr/>). We can therefore rule out any significant impact of changes in CO₂ concentration. We have mentioned this in section 3.1.

5. The perspective of comparisons with ice sheet model results has been added to the conclusions.

6. Table 1 now includes the details of the orbital parameters.

Technical comments - All the detailed suggestions have been taken into account.

Interactive comment on Clim. Past Discuss., 7, 1585, 2011.

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)