

## ***Interactive comment on “Climate reconstruction from pollen and $\delta^{13}\text{C}$ using inverse vegetation modeling. Implication for past and future climates” by C. Hatté et al.***

### **Anonymous Referee #1**

Received and published: 9 February 2009

The manuscript by Hatté et al. is a well written paper focused on the added value of additional proxy constraints. The paper is a good combination of description of the novel methodology (the "isotopic niche") and the demonstration study for the La Grande Pile site. The study reveals that using both pollen and  $\delta^{13}\text{C}$  data considerably reduces uncertainty in the temperature and precipitation reconstructions. Moreover, the reconstructed climate instabilities during the Eemian period are similar to the ones revealed from the marine records. This indicates a potential of this method for better synchronization of terrestrial and marine archives.

General comments

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



Plant species and their large-scale aggregations (such as biomes) have some plasticity in the climate space linked to the plant abilities to modify their biophysical and biochemical parameters (traits) in response to the environmental change. This ability of plants (and plant functional types) to modify their traits in response to the climate and CO<sub>2</sub> changes is not well accounted in vegetation models yet. This general limitation might be commented in the paper.

The vegetation model is used here as a transfer function from the d13C, CO<sub>2</sub>, and pollen records into the climate space. This is a more precise method than the modern analogue technique but it is also much more computationally demanding and less transparent. It would be good to include a brief comparison of advantages and shortcomings of the new approach with the modern analogue method.

#### Specific comments

Page 79, line 5. "The percentage of sunlight for each month, which is also an input of BIOME4, is estimated by linear regression from temperature and precipitation of the same month as described by Guiot et al. (2000)." Are monthly changes in the incoming solar irradiation due to altered orbital parameters accounted in the BIOME4 simulations?

Line 12: "Generally, convergence is achieved after several thousands of model runs." It would be good to provide here a rough estimate of computational costs of this procedure.

Figures: Please note in the Figure 1 caption that the scale of the x-axis is inverse. Axis labels of this figure are too small and not easy to read.

---

Interactive comment on Clim. Past Discuss., 5, 73, 2009.

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