

Interactive comment on “Effect of vegetation on the Late Miocene ocean circulation” by G. Lohmann et al.

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The paper submitted by Lohmann et al. is an important contribution for the understanding of Miocene climate and vegetation using model simulations compared with proxy data. The text is clear and figures useful. I recommend its publication after answering the following minor remarks.

Introduction.

Second paragraph: it is asserted that “the Tortonian was characterized by ... the buildup of ice sheets in the North Atlantic realm”. However, it is generally accepted that the onset of the Arctic icecap strengthening occurred in the Mid-Pliocene. Maybe the authors are influenced because the Tortonian climate was almost congruent with

the present-day one. If not, some reference is to be added. Considering the land temperature reconstruction, it is demonstrated that the present-day latitudinal thermic gradient already existed in Europe at the Tortonian (see Fauquette et al., accepted in which A. Micheels is co-author). The thermic latitudinal gradient probably increased during the Serravallian.

Fifth paragraph.

Some mid-latitude pollen floras also support the Eocene/Oligocene climate change in Europe, such as Schuler (1988) (Thesis, Univ. Strasbourg). Dry grasslands did not expand through much of the lower mid-latitude just after the Mid-Miocene Climatic Optimum: it was done a long time before (Oligocene?) according to the Early-Mid Miocene pollen data along a West European – African transect (Jiménez Moreno, 2005: PhD thesis, Univ. Lyon 1 and Granada; Jiménez Moreno & Suc, accepted at Palaeo3 – NECLIME Vol.).

3. Results

3.1 Hydrological cycle and vegetation cover

Vegetation simulation for the Tortonian indicates a homogenous “warm grass” cover over the entire North Africa (Fig. 1). There is no difference between the NW and NE Africa on contrary to that evidenced by Griffin (2002: Palaeo3, 182) for the Messinian and supported by pollen records (Fauquette et al., 2006: Palaeo3, 238) with savannah-like open vegetation to the East and dry steppe to the West. This matter could be discussed.

Legend of Fig. 1 shows some confusion between “savannah” and “warm grass”: I suppose that “warm grass” correspond to subdesertic Mediterranean-like open vegetation; this might be specified.

4. Discussion

I think that “the vegetation effect on the ocean circulation” presented as a result of the

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paper needs some additional explanation to be more clear.

There are some typographical errors such as “exchande” (“exchange”) on line 3 of the Conclusion.

The reference “François et al., 2006 must be completed: Palaeo3, 238, 302-320.

The reference New et al. (1999) cited on Fig. 1 is missing in the reference list.

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