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Climate of the Past Discussions

Interactive comment on "The MIS 11 – MIS 1 analogy, southern European vegetation, atmospheric methane and the "early anthropogenic hypothesis"" *by* P. C. Tzedakis

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Anm additional expert review was received after the end of the discussion period, and is given here:

Tzedakis, P.C. Climate of the Past The MIS 11-MIS 1 analogy, ... Review

In general this is a very well written paper addressing an interesting topic and notably bringing the view from terrestrial pollen record to arguments about the right analogs for the Holocene with respect to the "early anthropogenic hypothesis." The argument that MIS 19 may be a better analog is clearly presented and the strengths and weaknesses of this position are discussed in an even-handed way. Although there are some weak-

nesses in the data, in the sense that it would be desirable to have a higher resolution pollen record, I think they are fairly dealt with and that this paper can stimulate more thinking on the subject.

Ultimately the point of this paper hinges on Figures 7 and 8, and whether the methane trends in MIS19 and MIS1 as plotted in that figure 7 look similar, and whether the pollen and methane trends as plotted in Figure 8 look similar. Given the lower resolution of the MIS 19 data, and the fact that every interglacial must be a little bit different, the answer is a bit subjective. The EDC methane peak at 780 ka may be a millennial scale feature, in which case it would not necessarily be related to the characteristics of interglacials. On the other hand, perhaps the late Holocene rise in methane is a result of similar millennial scale processes. The comparisons in Figures 7 and 8 are probably the best we have for now, and the manuscript recognizes the limitations of the data quite honestly.

Some specific comments on the manuscript: A primary comment is simply a request to make it clearer what is meant by "precessional alignment," "termination alignment", and "obliquity alignment." As I understand it the original time scales are used for most of the data sets. For example in Figure 2 ice core methane and ïĄď'D data are plotted on the EDC3 time scale for -50 to +50 ka and the MIS 11 interval. An orbital parameter, either precession or obliquity, is also plotted, presumably on the orbital time scale (the x-axis label is "EDC3 time scale", making this confusing). Then, the MIS11 data and orbital parameters are simply shifted en masse with respect to the data and orbital parameters for -50 to +50 ka, until either the precession parameter variations match, or the terminations match (or later in the paper, until the obliquity curves match). It may be important to point out that the methane data are not used to align data sets, as has been done by other authors. Errors in the ice core time scale are not discussed here, as noted by other reviewers, but they should be.

Also, it would be useful to describe what the precession parameter plotted in Figure 1 and elsewhere is. For readers used to seeing insolation curves the appearance

of a negative value for precession at 10 ka may at first glance be puzzling – a brief explanation (text book stuff) could be helpful.

Page 1344, Line 6. The role of VOC in the methane budget is not that certain. See Lelevield et al. 2008 in Nature for an alternate view.

Interactive comment on Clim. Past Discuss., 5, 1337, 2009.