

## ***Interactive comment on “North–south palaeohydrological contrasts in the central Mediterranean during the Holocene: tentative synthesis and working hypotheses” by M. Magny et al.***

**Anonymous Referee #2**

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Authors put together evidences from data of the LAMA project and other published studies to support the presence of a climate oscillation with alternating wet/dry conditions north/south of 40N. In other words, approximately 40N represents the nodal line of a dipole: when conditions are wet north of 40N they are dry south of it. Millennial scale transition (reversal) from one phase to the opposite occurred twice. The first transition at time between 10300 and 9000 (depending on whether one considers the north or south areas) and 4500 years before present. The phase after 4500 (upper Holocene) is “wet north and dry south” (and, in my understanding it is the present con-

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dition). Further, the entire Holocene is punctuated with centennial scale oscillations, which are suggested to have similar characteristics and coherency (in time and as overall pattern) and similarly involved the whole Mediterranean region. The synthesis provided in this manuscript is interesting and useful. I recommend the publication after considering the following list of comments.

1) I do not see clearly that this oscillation has a seasonal connotation. E.g. fig 4 for Pergusa shows that around 4500BP both winter and summer precipitation decreased. My visual estimate considering the central level of the shaded area in figure is that both winter and summer precipitation are about 25mm lower in the upper than in the central Holocene. At Accesa after the first part of the record (lower Holocene, until about 7.7 (again, this is my visual estimate) dry/wet period were sometimes in phase and sometimes out of phase between summer and winter.

2) Authors use present NAO to interpret these changes in term of circulation patterns. Why not to account for other teleconnection patterns as well. Eg. EAWR, EA, SCAN ...,...? superposition of different regimes can explain complexity of patterns in this region? This issue is mentioned, but not really explored for interpreting the data. In the present climate conditions other teleconnections have a role comparable or even larger than NAO in the Mediterranean region. At page 22, the discussion in the first paragraph, shows how hard is to reconcile a NAO like influence making NE milder and wetter with at the same time more humid conditions over the Mediterranean region. Possibly, considering also other teleconnections could help and I suggest the authors explore this possibility (see Trigo R. et al. (2006). Relations between variability in the Mediterranean region and mid-latitude variability, published in “Mediterranean Climate Variability”, P. Lionello, P. Malanotte- Rizzoli & R. Boscolo ( eds) , Amsterdam: Elsevier, pp. 179-226.

3) At several time, authors mention a “conflict between palaeo-climatic records depending on the proxy used for the reconstructions”. Explicitly, what are these conflicts? Is there a reference in the literature?

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4) Authors mention as explanation of the observed variability (1) the possible blocking effects of the North Atlantic anticyclone linked to maximum insolation, and/or (2) the influence of the remnant ice sheets and fresh water forcing in the North Atlantic Ocean. In general, these two hypothesis look plausible, but it would be nice that the authors mention some study (possibly model simulations) to quantitatively support them. Along the same type of request for clarification: links between Hadley and monsoon should be better discussed referring to peer-reviewed literature (Gaetani et al., 2007 looks like an internal report). In there a quantitative estimate of how much the maximum solar insolation has produced a very strong Hadley circulation? Model simulations would help in my view.

5) A table with the proxy, the period, the time resolution, the estimated variables for each record would orient the reader across the data. May be also a unique map with all data locations could be useful.

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Interactive comment on *Clim. Past Discuss.*, 9, 1901, 2013.