

Interactive comment on “Asian aridification linked to the first step of the Eocene-Oligocene climate Transition (EOT) in obliquity-dominated terrestrial records (Xining Basin, China)” by G. Q. Xiao et al.

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The manuscript presents an stimulating and generally convincing high resolution magnetostratigraphic time control of the continental upper Eocene succession in the Xining Basin. Lithostratigraphic and high-resolution multiproxy records well constrain the cyclostratigraphic reconstruction of the record. I like the paper. It is well written and balanced in the speculative approach to the results. I have some minor comments that would like the authors could consider in their final review. 1. Correlation among the three regional sedimentary records proposed in Fig. 5 should be improved. Actually, although the three records show very comparable cycle patterns, a bed to bed correla-

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tion it is not ever evident. In my opinion the reader could be definitively convinced of the proposed regional correlation by a more detailed identification of coeval cycles and/or by a brief discussion about missing gypsum layers in the different successions. 2. In Fig. S1 I suggest to add a lithostratigraphic column, with lithological cycles, to better follow description provided by the authors. However, I think it is important to explain in more details the approach followed to propose different scenarios in tuning the record. I consider this is a key point to definitely convince the reader about the reliability of the proposed cyclostratigraphy. 3. Coincidence of lithofacies change with first step in oxygen isotope changes, preceding the base of the O1-1 is exciting and provide a unprecedented teleconnection evidence between continental and marine realms at the EOT. I suggest, also in consideration of the main focus of the journal, that the authors add information and provide further details on the climate-ocean dynamics that could have produced this important global response. 4. I was wondering if any correlation between the studied continental record and the 1.2my astronomical forcing (reported in Fig. 7) could be evidenced and discussed in order to reinforce the reliability of the proposed tuning. 5. Though the obliquity forcing dominates outside a interval with low eccentricity values and is caused by incipient ice sheets (and I believe it) it is important to show more evidence in the oxygen isotopes of marine records worldwide distributed and/or provide alternative scenarios that could include limited ice sheet volumes and reduced effect on the hydrological cycles and $\delta^{18}\text{O}$ changes. It is important to me to reinforce a bit the interpretation of cycles in the studied records as direct response to obliquity forcing.

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