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Climate of the Past Discussions

Interactive comment on "Late Miocene-Pliocene climate evolution recorded by the red clay covered on the Xiaoshuizi planation surface, NE Tibetan Plateau" *by* Xiaomiao Li et al.

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Dear reviewer, We would like thank you for having read and commented our manuscript and we would like to apologize for the delay in our answer. We are grateful for your questions and suggestions. It's very useful and enlightening. We will take consideration in the revised paper. Here, we provide some quick replies to your questions. Lines 114-115: What makes the XSZ red clay different geomorphologically? The Xiaoshuizi peneplain of the Maxian mountain occupies a critical transition position between the high-altitude TP and the low North China Craton (Li et al., 2017). Line 133-134: not sure exactly what is meant here. Is the XSZ core characterized by more continuous deposition and records a longer time interval than the Shangyaotan core? Yes, SYT core is only covered the age from 6.4 Ma to 4.2 Ma. Line 168: Is all of the remaining Ca in silicate minerals? Won't a lot of it be loosely bound to clay minerals in the soils? Also, the correction for Phosphorous also needs to be explained. I'm guessing you are assuming some component of Ca-bearing phosphate minerals, but what is the basis for this assumption. Thanks for your questions and suggestions. No, not all of remaining Ca in silicate minerals and the Ca bound to clay minerals is also included. Silicate-bound CaO* is obtained, in theory, by the simple equation (Fedo et al., 1995): CaO*(mol) = CaO(mol) –CO2(calcite mol) − 0.5 CO2(dolomite mol) − 10/3 mol P2O5(apatite). It generally calculated based the assumption that all P2O5 is associated with apatite and all inorganic carbon is associated with carbonates. It may neglect the Ca bound to clay minerals and overestimate the component of Ca-bearing phosphate minerals (Garzanti and Resentini., 2016). The reason we use the equation to calculate the values is that we try to expel the possibility the variation of Sr is determined by the bound of secondary carbonate, but not by weathering intensity. For Sr can substitute Ca in secondary carbonates (Reeder et al., 2006; Buggle et al., 2011). We will explain it in the revised paper. Line 199: What do you mean by durations? Are you saying there are some thicker intervals of high magnetic susceptibility? Yes, it means the interval of strong pedogenesis sustained longer. Figure 1: I think it would help if you put a larger non-circle shape on panel A corresponding to the study site. Then you can remove the Xiashuizi label, which slightly obscures the vector. Then, match this symbol on panel C You are missing the white reversals between C3n.1n, C3n.2n, and C3n.3n on the Polarity plot for the XSZ section. These were included in the age model presented in Li et al. (2017). What do the black bars on the lithology column represent. Thank you for suggestions and pointing faults out. We have not noticed it in Fig. 1b. There is something wrong with this figure when we convert it into PDF format. Some thin white rectangles are missed. The black bars on the lithology column were the thin white rectangles representing the carbonate nodule layer. We give the figure1s of records versus stratigraphic depth. Reference Buggle B, Glaser B,

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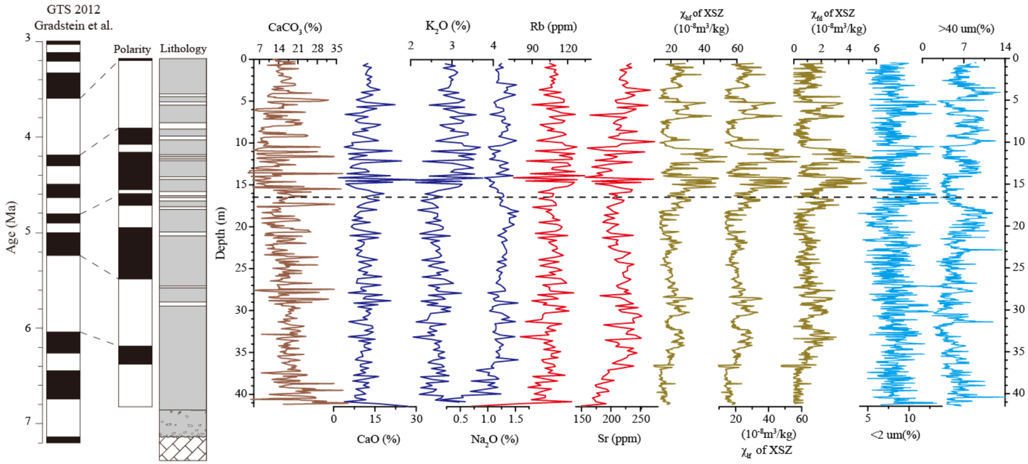

Fig. 1 s. Variations in carbonate content, major element concentration, minor element concentration, magnetic susceptibility and grain size from the XSZ red clay section, spanning 6.7-3.6 Ma

Fig. 1.

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Discussion paper