

## ***Interactive comment on “Holocene climatic evolution at the Chinese Loess Plateau: testing sensitivity to the global warming-cooling events” by Taslima Anwar et al.***

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Based on a multi-parameter study of two sites (6 sections) in the East Asian monsoonal region, this paper found 3 warm-humid intervals during the Holocene in northern China. The age model of the studied section is based on OSL dating performed by previous work. I feel that this is a good contribution to the journal. I have a few comments to help to further improve the paper, mainly its clarity. I consider the data quality high. Separating temperature from precipitation is a challenging task for paleoclimate research. In this case, I am convinced that there were 3 wet intervals during the Holocene in northern China based on their magnetic parameter records, but I am not sure if all the recognized wet periods are necessary warm. One way to test

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whether the three periods were both warm and wet is by comparing Xarm/SIRM and Xarm/Xlf variations, as is used before. If climate was both warm and wet, Xarm/SIRM and Xarm/Xlf should covary (Nie et al. 2013 QR; 2014SR). So I encourage the authors to pay more special attention to the subtle but recognizable changes between Xarm/SIRM and Xarm/Xlf. Particularly, I feel that the pedogenic feature is more apparent in the Xarm/SIRM record and the magnetic concentration parameter records, but is a bit damped in the Xarm/Xlf record on pages 45 (YZ1 section), 46 (YZ2 section), 47 (YZ3 section). For JJ3 section, the relationship between Xarm/SIRM and Xarm/Xlf seems more complicated. This suggests to me temperature and precipitation might not be as coupled as traditionally thought, at the examined timescale. Minor points: 1. Magnetic susceptibility is defined as MS in line 166 and thus, magnetic susceptibility should not appear in the following text such as line 233 and 236. 2. I don't agree with the observation that Xarm/SIRM and Xarm/Xlf covary with each other and with bulk grain size. There are subtle but recognizable differences in terms of Xarm/SIRM and Xarm/Xlf variations for several sections. I think the subtle differences might be because Xarm/Xlf is more affected by temperature variations, as is demonstrated by Nie et al. (2013) QR and (2014) SR. So by neglecting these changes might the authors not completely pull out all the encoded information from these records. 3. Some of the references are out-of-date and this paper didn't incorporate the new progresses about loess provenance. For example, loess's zircon U-Pb geochronology data exhibit most similarity with those of the Yellow River sediments (Nie et al. 2015, NC), not the Gobi desert, suggesting that the Yellow River drybed sediments are major source for loess. Accordingly to Licht et al. (2016) GSAB, Yellow River sediments take a proportion of 60-70% for loess provenance. However, in line Line 288, these new progresses did not get reviewed and incorporated. 4. Can the author address the difference in terms of Holocene moisture evolution pattern between the East Asian region and the central Asian region? It seems that the Holocene Central Asian area moisture evolution is different from the East Asian monsoon region (Chen et al., 2008, QSR). If so, the authors might need to change the statement that the Holocene moisture pattern they observed

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is global.

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