

Interactive comment on “Lagged variation of moisture conditions in central Asia compared with monsoonal Asia during the last four interglacials” by Jia Jia et al.

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In this manuscript, the authors compare the magnetic susceptibility records between the DK and the Xifeng sections and conclude that the moisture variation in central Asia lagged the one in monsoon Asia by 0-5 kyr during four interglacials. Understanding the phase relationship between climates of different regions is extremely important for improving our understanding of the forcing and feedback mechanisms, and this kind of study should be encouraged. However, the analysis of phase relationship between two records has a high demand on the quality and accuracy of the chronology of the records. In this study, there are weaknesses in chronology that prevent me to be con-

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vinced of the results. Firstly and most critically, age uncertainty is not mentioned in the paper. As far as I know, the age uncertainty in loess records can reach several kyr. How would the conclusion of the authors be influenced by the age uncertainty of the two loess records? Secondly, the chronology of both DK and Xifeng sections was developed by correlation with the marine oxygen isotope record. This is quite acceptable in many loess studies, but I feel it is questionable when discussing phase relationship because the chronology of the two records is not independent. Lastly but less concerned, the mechanisms given by the authors to explain the phase difference between the two records is unclear for me. Response: As the reviewer mentioned, the absolute independent dating usually presents thousands or more than ten thousands error, that is why we selected the relative dating method to construct chronologies of two sections. And it is important, some absolute independent dating result had published in previous studies which provided a base to construct the chronology. We believe the grain size parameter is mostly independent of frequency-dependent susceptibility. If they are not independent, they will vary in-phase or anti-phase. However, our data exhibited DK loess record (Tajikistan loess) presents a lagging change of magnetic parameter, which is different from the XF section (Chinese loess) record. In the Chinese Loess Plateau, all loess records exhibit a synchronous variation between mean grain size and frequency-dependent susceptibility on the orbital scale, and that is independent with the pedogenic intensity of soil units (Hao et al., 2012). For the last question, due to the reviewer have not pointed out where is the problem, I cannot reply.

References: Hao, Q.Z., Wang, L., Oldfield, F., et al., 2012. Delayed build-up of Arctic ice sheets during 400,000-year minima in insolation variability, *Nature*, 490, 393-396.

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