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Climate of the Past Discussions

Interactive comment on "Variation in the Asian monsoon intensity and dry-wet condition since the Little Ice Age in central China revealed by an aragonite stalagmite" *by* J.-J. Yin et al.

Anonymous Referee #2

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Yin et al. present the precisely dated high-resolution δ18O record of an aragonite stalagmite from Lianhua Cave and compare this record with the solar irradiation, eastern China temperature record, historic dry/wetness index, and ENSO index since Little Ice Age. The authors suggest that the changes in local dry-wet condition dominate the δ18O variation on decadal to centennial time scales, and solar irradiation and associated temperature changes and ENSO activity play important roles in modulating the summer monsoon intensity and hence the speleothem δ18O. It's evident that the record is well dated and in high-resolution. However, I hesitate to recommend this manuscript to be published as it is before the following issues have been clarified:

The authors used the Hendy Test to prove the stalagmite was deposited under the

isotope equilibrium conditions. I think that the correlation between δ18O and δ13C along the growth axis would be good to further indicate the stalagmite was deposited under isotope equilibrium conditions. Actually, Hendy Test is hard to be fulfilled in practice as argued by the Dorale and Liu (2009, Limitations of hendy test criteria in judging the paleoclimatic suitability of speleothems and the need for replication,Journal of Cave and Karst Studies, 2009, 71, 73-80). The replication is the best approach to use. In 2008, Cosford et al. have published a δ18O record from Lianhua cave and it covers the time period from 1300 to present. So, the comparison with this record is more robust than the Hendy Test.

It seems that there is a 300-400 yr cycle in Lianhua record and the significant increases of δ18O since 1940 maybe a portion of this cycle, but not the greenhouse gas forces on the monsoon intensity. Because the δ18O record also indicates a increasing trend during the period from 1470 to1650, and this trend cannot be interpreted by the changes in solar irradiation and temperature as well.

page 1307 line 12, "The comparison of the δ18O record with the local instrumental record and historical documents exhibits at least 15 drought events in the Wuling mountain and adjacent areas during the Little Ice Age,. . .." but from figure 7, there are 16 droughts indicated from 1350 to 1900AD and only 8 droughts lie within the Little Ice Age, i.e., from 1550-1850 AD. Please describe them accurately and clearly.

The authors suggest that the persistent increases of speleothem δ18O during the last 50 years indicate the weakening of the summer monsoon intensity. However, as shown by figure 8, there is no clear decreasing trend in the local precipitation record. So, how to interpret the decoupling of the precipitation amount and monsoon intensity during this period.

I suggest the authors combining the figures 1 and 3 as one figure.

Interactive comment on Clim. Past Discuss., 10, 1305, 2014.