

## ***Interactive comment on “Isotopic and lithologic variations of one precisely dated stalagmite across the Medieval/LIA period from Heilong Cave, Central China” by Y. F. Cui et al.***

**Anonymous Referee #2**

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> This manuscript presents a multi-proxy analysis of the Monsoon over China from a single stalagmite sample. The record shows a distinct change in the relationship between local aridity proxies (i.e.  $\delta^{13}\text{C}$ ) and large scale hydro proxies (i.e.  $\delta^{18}\text{O}$ ) at the transition between the LIA and MWP. This changed relationship reflects a change in atmospheric circulation where  $\delta^{18}\text{O}$  went from being closely related to local precip amount to being influenced by moisture source changes that were not inherently tied to precip amount. The study is a really nice complement to a number of modeling studies, which have highlighted the problem with assuming  $\delta^{18}\text{O}$  over China is related to local climate. The method could be applied elsewhere on Chinese Stalags to identify periods where  $\delta^{18}\text{O}$  is a good local proxy and when it is not. The writing is relatively clear, the

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interpretations are smartly conservative and while the paleoclimate data is not groundbreaking it is an important step forward in assessing how to analyze the growing body of  $\delta^{18}\text{O}$  data from China. I wish the authors had embraced the modeling work of Dayem, Pausata and LeGrande etc. . . and placed this current study in the context of the modeling of  $\delta^{18}\text{O}$  over China. > > Pg. 1276 > > Ln 2: to explore multiple speleothem? > Ln 5: dates are precise > Ln 15: index from historical > Ln 21: What is “the Mei-Yu”? > Ln 24: intensively studied? > > Pg. 1277 > > Ln 2: oscillation involved > Ln 10: made using > Ln 15: well constrained dating, > Ln 17: applied as a > Ln 20: “indicate a coherent monsoon pattern, with an increase...” > Ln 26: “test the relationship between” > > Pg. 2778 > > Ln 7: “by the highly seasonal variations of the water excess” . . . what is “water excess”? > Ln 17: “The relative humidity inside is close to 100 %.” How as this assessed? > Ln 18: “monsoon” > Ln 19: “Mean annual precipitation between 1000mm and 1500mm shows a significant seasonal variation.” How does mean annual precip “show” significant seasonal variation? > Ln 20: Summer and winter monsoons only account for 55% of precip? > > Pg 1280 > Ln 11: develop a chronology for the stalagmite > > Pg. 1281 > > Ln 2: “The amplitude seems larger during the interval of 0\_73mm (mainly covering the LIA, approximately 1.3 % than the other part.” Changes in amplitude could be quantified as opposed to just noted ad hoc. > Ln 12-15: In light of the numerous criticisms that now abound with respect isotopic controls of precip over China, some more consideration is warranted here. > Ln 24: Could  $\delta^{13}\text{C}$  reflect natural secessional trends in forest that may or may not be intimately tied to climate. Things like fire, which may be stochastic? > > Pg 1282 > > Ln 25: “summit”, is perhaps not best word choice here. > > Pg 1284: > > Ln 1: I am very familiar with the manifestation of Active and Break patterns over India but less so over China. Could this be shown with a figure? Such as maps of precip anomalies over China during active and break periods? > Ln 11: “remarkable resemblance”, this is somewhat subjective until supported by correlation statistics. > Ln 15-17: This is a really interesting comment! > Ln 18: The monsoon is also dominated by land surface processes and local convective development. Yes, related to the ITCZ but not

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exclusively as implied. > > Pg. 1285: > > Ln 5: Note Berkelhammer et al., 2010 EPSL show an 89-year cycle in Monsoon. > Ln 7: Would be worth doing cross spectra and/or cross wavelet between d18O and d13C. Notably to document if the spectral power and or phasing changes across the LIA/MWO transition. > >

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Interactive comment on Clim. Past Discuss., 8, 1275, 2012.