Dear Editor Dr. Yin and Anonymous Reviewers:

We really appreciate your time and efforts that you have spent in reading, reviewing and handling our manuscript. Your comments and suggestions have greatly improved our manuscript. Following these insightful comments and suggestions, we have conducted a point-to-point revision as listed below. We have reproduced the reviewers’ comments in blue fonts, and our responses in black fonts directly below the comments. We hope that our revised manuscript is now considered to be suitable for publication with your high standard journal.

**Main Comments:**

1. The speleothem oxygen-isotope has high resolution, thus, its upward or downward trends over some specific time periods need to be quantified using the trend test methods e.g. Mann-Kendall non-parametric trend test. Moreover, the magnitude and amplitude of the EASM intensity also need to be calculated.

Reply: Many thanks for your suggestion. The upward trend during the MCA has been constrained through a linear fit method in the stalagmite δ18O record and other climatic reconstructions (see new Fig. 4) in the revised manuscript. The magnitude and amplitude of the stalagmite δ18O records have not been calculated. This is because the strength of MCA, LIA and CWP is not globally coherent, and in addition, our Yongxing record does not span the whole MCA and CWP periods. Most importantly, stalagmite δ18O records in each cave do not have the same absolute values over the same period and their fluctuations are not coherent as well because of the different rainfall mixing extent in the epikarst zone.

2. According to the background of the co-authors, a more mechanism of EASM variation should be discussed. e.g. how the NAO effects the East Asian summer monsoon, based on some instrumental datasets or CMIP5 datasets.

Reply: Thanks a lot for pointing out this. More mechanisms of EASM variation have been added based on some instrumental datasets. We have added the following text in our revised manuscript:

“An analysis of instrumental data indicates that the winter NAO signal can be transmitted to East Asia through a wave train bridge and leads to a drier southern China but slightly wetter central China (Sung et al., 2006). On the other hand, Wu et al. (2009) have proposed that NAO-related spring SST anomalies in the North Atlantic can produce anomalous anticyclonic circulations over the Okhotsk Sea, which help to enhance the subtropical monsoon front.”

3. The other proxy reconstruction from tree-ring [Liu et al., 2019] and historical documentary [Ge et al., 2008] are suggested to cross check the speleothem EASM reconstruction. Moreover, a detailed and independent local temperature reconstruction should be used to explore the relationship between the speleothem oxygen-isotope and the temperature, e.g. [Cook et al., 2013; Shi et al., 2015; Zhang et al., 2018].

Reply: The other proxy reconstructions from tree-ring (Liu et al., 2019) and historical document (Ge et al., 2009) have been utilized to cross check the speleothem δ18O record. Moreover, local temperature reconstructions have been utilized to make a comparison with our stalagmite δ18O record. However, our stalagmite δ18O record does not show a significant correlation with these climatic reconstructions (see Figs. 1 and 2 below in our response).

Fig. 1 Comparisons of the Yongxing δ18O record with other proxy reconstructions. (a) Meiyu rain from historical documents (Ge et al., 2008); (b) Yongxing δ18O record (this study); (c) Precipitation reconstruction from tree-ring (Liu et al., 2019).

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Fig. 2 Comparison of (c) the Yongxing δ18O record and temperature reconstructions by (a) Zhang et al., 2018 and (b) Shi et al., 2015.

**Specific Comments:**

1. Page 1, Lines 25-26. What meaning is the 'EASM intensity'? the amplitude or magnitude of the EASM variation?

Reply: The EASM intensity means the magnitude of the EASM itself. Based on a recent study of Zhang et al., (2018), we have rephrased the “EASM intensity” to Meiyu rain in our revised manuscript.

2. Page 2, Line 49. It is 'Mann'. Moreover, Chen (2018) is not the temperature reconstruction.

Reply: Many thanks for your corrections, we have changed ‘Man’ to ‘Mann’ and deleted ‘Chen (2018)’ in our revised manuscript.

3. Page 2, Lines 63-67. The detained review about the disagreement of the influence ENSO on EASM is very interesting and suggested to help the following analysis.

Reply: Many thanks for your positive comments here.

4. Page 3, Lines 78-79. The 'direct evidence' is not rigorous, even it is still difficult to connect the AMOC and EASM for the instrumental dataset analysis.

Reply: Thank you for your comments. We have revised the original expression as “available empirical data is still rare to explore the potential link between the AMOC and regional precipitation during the MCA and LIA intervals” in our revised manuscript.

5. Page 4, Lines 132-133. There is a large discrepancy between YX262 and YX275 in the early 1600s. A discussion of this difference is suggested to indicate a stable condition of the isotope.

Reply: Thank for your suggestion. We have added some discussion as follows: “A minor difference exists between the two stalagmite δ18O records. The YX262 record shows a larger shift toward more negative values than the YX275 record in the early 1600s. Different feeding systems for both the stalagmites probably produce the δ18O discrepancy. Longer mixing of meteorological rain within the overlying bedrock may dampen the overall rain δ18O amplitude and therefore lead to the calcite δ18O offsets (Tan et al., 2019; Carolin et al., 2013). Overall, the good replication between the two records suggests that the YX262 δ18O signal is less influenced by the kinetic fractionation and is primarily of climatic origin.” in our revised manuscript.

6. Page 5, Lines 141-142. The EASM intensity is not equal to the local rainfall, e.g. the increasing meiyu rainfall means the weak EASM.

Reply: Thank you for your suggestion. We have revised this inaccurate expression. ‘the EASM intensity’ has been revised as ‘Meiyu rain’.

7. Page 6. Lines 188-189. The statement is inaccurate, since the north-drought and south-flood can be affected by the same factor from the instrumental analysis.

Reply: Thanks for your comment. We suggest that the north drought and south flood could result from meridional migration of the Meiyu rain belt (Yu and Zhou., 2007; Zhou et al., 2009; Zhang et al., 2018). We have added this statement in our revised manuscript.

8. Page 7, Lines 214-215. In fact, the EASM becomes weak since the late 1970s [Wang, 2001].

Reply: The EASM shows remarkable multi-decadal variability during the 20th century. The weakening of the EASM since the late 1970s attracts wide attention (Wang., 2001; Zhou et al., 2009). Recently, it is suggested that the EASM has been recovering since the early 1990s (Liu et al., 2012). Here our stalagmite record shows that the EASM increase step by step since the end of LIA on the centennial scale, generally in agreement with the increasing tendency of the global temperature. We interpret the weakening of the EASM between 1970s-1990s as a portion of the EASM multi-decadal variability, which punctuated the centennial EASM increasing since the LIA.

9. Pages 7-8. Lines 229-235. When you check Walker cell, the position of ascending or sinking branch is also important for atmosphere transport.

Reply: Thank you for your suggestion. We have considered your comments here in our revised manuscript.

10. Pages 9-10, Lines 278-311. The relationship between NAO and EASM during the CWP is complex, why it is stable during the LIA or MCA. Is a possible reason the uncertainty of NAO reconstruction?

Reply: The correlation seems better between the NAO and EASM over the MCA and LIA than the CWP. For example, a maximum monsoon rainfall centered at 1900AD corresponds to a more negative NAO index, contradicting to the relationship between them over the MCA and LIA. The proxy-based NAO index (Trouet et al., 2009) used in the context can be consolidated by the instrumental NAO index series (Jones et al., 1997). The varied relationship over the CWP may depend on timescales as well. A better relationship occurs on centennial scales, rather than on decadal or shorter timescales.

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