Responses to the Editor

Initial comments in red italics, responses in plain text

Both referees have major concerns regarding the interpretation of the calcite oxygen isotopes and both are asking for more detailed information on oxygen isotopes in modern precipitation. I support their concerns and a more detailed discussion on the climatic and environmental factors influencing del18O in present-day rainfall is necessary to warrant publication in CoP. Furthermore, I wonder whether you could also provide further information on uncertainties of your quantitative reconstruction.

1）We put more information about the calcite oxygen isotopes in the revised manuscript shown as follows (line 127-138). The idea of reconstructing regional rainfall between two caves by comparing two spatially separated cave records along the same moisture transport pathway is to presume single stalagmite $\delta^{18}O$ values from monsoon areas at least contain rainfall information. For Chinese stalagmite $\delta^{18}O$ values, they are indeed influenced by different types of precipitation, and as well as moisture source and its pathway, local condensation and evaporation processes (Dayem et al., 2010). And a recent millennial climate simulation also suggests that Chinese stalagmite $\delta^{18}O$ records could be used as an indicator of intensity of the East Asian summer monsoon in terms of the continental scale Asian monsoon rainfall response in the upstream regions (Liu et al., 2014). As both Dongge and Heshang $\delta^{18}O$ records respond to the upstream rainfall respectively, the difference of the two records should be related to the regional rainfall between Dongge and Heshang cave.

2）As compared with oxygen isotopes in modern precipitation, monitoring cave drip water $\delta^{18}O$ should reflect stalagmite $\delta^{18}O$ more directly. Though there are no published monitoring records from Dongge cave, we pick up a drip water $\delta^{18}O$ record from May 2011 to April 2014 from Liangfeng cave, a cave close to Dongge, to compare the drip water $\delta^{18}O$ data between Liangfeng and Heshang. A significant positive correlation (R^2=0.79) between annual drip water $\Delta\delta^{18}O_{LF\text{-}HS}$ and regional annual rainfall amount gives a modern support for the reconstruction method. More details are shown from line 139 to line 180 in the revised manuscript.

3）To better access the uncertainty of the $\Delta\delta^{18}O$ record, chronology uncertainty has been discussed in the revised manuscript, which produces a maximum error of 0.76‰. Taken all the factors into consideration, the final uncertainty of $\Delta\delta^{18}O$ would be ~0.53‰, therefore the uncertainty of the reconstructed rainfall in southwest China would be ~100 mm/yr. The details are shown from line 101 to line 111, line 119 and line 126.

4）According to all the comments from the anonymous reviewers and the editor, we make a major revision on the manuscript by deleting the discussion section about the analysis of Yichang precipitation and Greenland temperature and the original Fig. 4, restructuring Method section with more discussions on the uncertainty of the $\Delta\delta^{18}O$ record and with more modern monitoring supports for the reconstruction method, revising Fig. 2 and adding another figure shown as Fig. 3. All relevant revised parts are marked in red.