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## ***Interactive comment on “The climate reconstruction in Shandong Peninsula, North China during the last millennia based on stalagmite laminae” by Q. Wang et al.***

### **Anonymous Referee #1**

Received and published: 22 October 2015

The paper is reporting climate reconstruction based on layer thickness of stalagmite ky1 in Shandong Peninsula, North China, it is interesting. Until now, there is no high-quality stalagmite records published in Shandong Peninsula. The authors indicate that the layer thickness and Asian summer monsoon intensity/precipitation have negative correlation themselves, and layer thickness and fluctuation degree of summer monsoon intensity/precipitation have positive correlation themselves. However, the mechanism between layer thickness and climate change in the study cave was not discussed and supported by enough evidences. In addition, the authors should give more evidences (e.g., drought/flood index) to interpret the 18O variation of stalagmite ky1 in Shandong Peninsula. And the relation between 18O variation and climate change in Shandong

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Peninsula and its mechanism during the last millennia should be much more interesting. This paper needs some revisions before being accepted for publication.

Additional issues:

1. In page 4648, line 5, Figure 4 (The cross-section of the sample) should be mentioned in the section of sample description. It's better to supply XRD results/figure to certify the mineral composition of the sample.
2. In page 4651, line 4, the maximum thickness reached more than 800  $\mu\text{m}$ , it's better to show the layer characteristic of the thickest layer in Figure 5.
3. In page 4651, line 15, did the layer rich of dark spots appear many times in the sample section? How can you make sure this dark layer is the annual layer, not the seasonal-layer precipitated only in winter/summer or dry/flood event?
4. In page 4654, line 6, The obvious synchronization relation between the layer thickness change of stalagmite ky1 and 18O value variation shows a closely relationship between the deposition rate variation of layers and climate change (Fig. 6). . . . . However, in figure 6, we found that most of the layers during the period 1370-1470 AD are thicker than those during 1217-1470 AD and similar to those during 1470-1540 AD, the 18O values during 1370-1470 AD are lighter than those in 1217-1470 AD and 1470-1540 AD. The relation between layer thickness and 18O value is not very good, maybe you can check the correlation coefficient between them. Here, the 18O of ky1 was interpreted as Asian summer monsoon/precipitation according to Cheng et al., 2009 and Zhang et al., 2008. Except this two references, I suggest to compare the 18O series with the drought/flood index reconstructed by historical documentary record. There are several published drought/flood indexes in North China, it will be much more convincing. By comparing layer thickness with 18O of ky1 and drought/flood index, it may be helpful to explain the variation of layer thickness.
5. In page 4655, line 5, On the other hand, the thickness of layer and the fluctuation de-

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gree of summer monsoon intensity/precipitation have positive correlation themselves, the high value period of layer thickness are correspond to high fluctuation degree of summer monsoon intensity/precipitation, and low value are correspond to low fluctuation degree of summer monsoon/precipitation. . . . Except during 1551 AD, the relation between the layer thickness and the fluctuation degree of summer monsoon intensity/precipitation is not good during other periods. The horizontal ordinates in Figure 6a and 6b are the same, however, why the grey bars labeled the thick layer in Figure 6a and high variability of 18O in Figure 6b are ansynchronous?

6. In page 4655, line 10~20, the interpretation of the relation between layer thickness and climate change should be supported by published reference or modern monitoring results in the study cave, and these references/results should be cited in the appropriate position, because the relation between layer thickness variation and climate change is the important and main conclusion of the paper.

7. In Table 1, please add the unit for “age corrected” and “age uncorrected” in the first column or illustrate in the annotation below the Table. It should be “BP”, but I also suggest that it’s better to add one row showing the age with unit “AD” in Table 1 and change all of the ages with unite “AD” appeared in the whole paper, because the period discussed in the paper is the last millennia.

8. Basing on the context and figure 3, it seems like that “BP” means before present 2013, not present 1950, in the paper. Because some researchers usually consider BP=before present 1950, so you need illustrate BP=before present 2013 in the annotation below Table 1. If it is right, the top of the sample should be  $1895 \pm 20$  AD, not  $1894 \pm 20$  AD, maybe some other ages in the paper also need to be checked.

9. In Figure 3, I think the 230Th age “ $361.4 \pm 13.6$  BP” is wrong, it should be  $316.4 \pm 13.6$  BP according to Table 1, and the duration between 6 mm and 15 mm should be 65 yrs not 67 yrs.

10. In Figure 4, the scale/rule should be added aside the sample. It is better to label

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the sampling positions of  $^{230}\text{Th}$  dating and XRD on the cross-section of sample ky1.

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Interactive comment on Clim. Past Discuss., 11, 4643, 2015.

**CPD**

11, C2100–C2103, 2015

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