

## ***Interactive comment on “Complex Principal Component Analysis of Mass Balance Change on Qinghai-Tibet Plateau” by Jingang Zhan et al.***

**Anonymous Referee #2**

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Based on complex principal component analysis (CPCA) and wavelet amplitude-period spectrum, this paper analyzes the spatial characteristics of mass balance change on the Qinghai-Tibet Plateau and surrounding areas, using 153 monthly solutions of temporal gravity data from GRACE. It was concluded that the major influence on the change of mass balance on the Qinghai-Tibet Plateau was the weakening Indian monsoon. The second major factor was El Niño. And the third was the westerlies and La Niña. Though some results are different from some other researchers', it is interesting to present some new explanation based on GRACE data.

Convincing evidences are required to support the authors' view.

How was the mass balance obtained in Figure 2?

Why choose the smoothness priors method for filtering? The authors should explain

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more.

How to ensure reliable results with CPCA?

Is it suitable to only analyze the first three major factors?

“However, we believe that geologic structural processes are slow.” Could the authors quantitatively describe the impact on mass balance change?

The discussion and conclusions can be improved.

The manuscript should be carefully revised. Some errors and suggestions are listed as follows.

There are no legends in some figures, such as Figure 2, Figure 3, Figure 4a and Figure 5a.

Line 22: the westerlies and of La Niña?

Line 48: TBP should be explained when it first appears.

Line 85: Qinghai Tibet Plateau?

Line 118: the left side of Eq. (3)?

Line 168: The number in Table 1 should be same as the number in line 168 and in the paper.

Line 273: the bracket?

Line 310: 74%?

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Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2016-259, 2016.

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