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Interactive comment on "Impacts of Tibetan Plateau uplift on atmospheric dynamics and associated precipitation $\delta^{18}O$" *by* S. Botsyun et al.

Anonymous Referee #2

Received and published: 29 February 2016

This is an interesting and important paper. It highlights the fact the assumptions behind using del-18O as a paleo-altimetry proxy are not well satisfied and that future work should consider the importance of some of these other effects. This point has been made before for the Andes but not for Tibet. The choice of model is also very good since the variable resolution allows them to better resolve the Himalayas and Tibet.

I therefore recommend this paper for publication subject to a number of minor modifications:

(a) There is no comparison between model results and current day observations of basic climate variables (e.g. precipitation, wind etc). They need to include an extra figure on figure4 and figure 5 (and related text), and perhaps on figure 3, showing the observed humidity transport and precip for comparison. I raise this because models

often do not do an especially good job at monsoons and this may influence the con-fidence we have in the results in figure 8 and 9, and the numbers quoted in fig 10. However, it is unlikely to change the main message of the paper (namely that these other effects are important).

(b) Related to this, in the conclusions section, I would also like to see a brief discussion of model uncertainties. The paper concludes by advocating greater use of GCM's but does not attempt to estimate the inherent uncertainties.

(c) Is it possible to more fully explain the post-condensation processes? The causes for the changes in relative humidity were well explained but I did not understand the post condensational effects. Why did they cancel out the relative humidity changes in figure 8 (int – low) but were unimportant for figure 9 (mod-int)? The paper describes these changes but does not explain them well.

(c) On a very minor point, in some figures (e.g. fig 4) the order is mod, int, low but in other figures (e.g. fig 5) the order is reversed. Could you please keep to the same order throughout.

(d) There are no units quoted for figure 3 and 4 and 12. There is no scale for the vectors in figure 3.

Interactive comment on Clim. Past Discuss., doi:10.5194/cp-2015-187, 2016.