

## ***Interactive comment on “Geometric dependency of Tibetan lakes on glacial runoff” by V. H. Phan et al.***

### **Anonymous Referee #2**

Received and published: 13 May 2013

The paper presents a sound method to estimate the geometric (=theoretic geometric) relation between lakes and glaciers on the Tibetan Plateau, not less, but also not more. The paper could become publishable in HESS after some major revisions, mostly along two major lines:

- accuracy/sensitivity of the method
- hydrological processes, significance and discussion.

My major comments:

(1) The Intro covers relevant studies, but it is mostly just a list of studies. You should summarize the key findings as relevant for your work. Also, you should develop the

C1662

motivation for your study based on that. As now, the motivation of your work is weakly described. (You should also include Zhang et al. (2013), GRL, even if just recently published, after your submission).

(2) You should write a section about the accuracies/problems/sensitivities with your results. Among the potential sources of problems:

- MODIS water mask (see below)
- how reliable is the combination of MODIS water mask and SRTM to define if a lake has an outflow or not? What with narrow channels that are not detected by SRTM? How about very flat outlets, where the detection based on SRTM might be randomly dependent of SRTM accuracy? How about seasonal variations (no outflow in one season, overflow in another)?
- How sensitive are your results against the deformations in the glacier mask?

(3) You should make clearer that your results are a theoretical geometrical dependency of lakes on glaciers. Make clearer what processes are neglected compared to a real dependency. E.g. under conditions of heavy evaporation the distance between glacier and lake might be an important factor. Same for losses to groundwater. Sure, there is more.

(4) The discussion section is not really a discussion. You just add two minor methodological aspects. What is lacking in the discussion and conclusions is a hydrological discussion, about the hydrological significance and representativeness of your results (e.g. see (3)), and perspectives. What needs to be done to arrive at hydrologically more meaningful results? How could they actually change the picture you give?

Specific comments:

- 2.1., MODIS land water mask. It became not clear to me what you did, and to what extent you used existing data (checked with GoogleEarth, Landsat, etc.? Did you that?).

C1663

- 2.1., MODIS land water mask. How do lake seasonality or trends affect the mask?
- 2.1. Which glacier mask did you use, the new one or the old one. You mention both, and it is not clear which you used.
- In general, there some redundancies. Try to remove repetitions throughout.
- Try to make the figures more readable. Size, resolution, colors.

END OF REVIEW

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 729, 2013.

C1664