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The Cryosphere Discussions

Interactive comment on "Numerical simulations of Gurenhekou Glacier on the Tibetan Plateau using a full-Stokes ice dynamical model" *by* L. Zhao et al.

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Dear colleagues,

as I am not an expert in ice flow modeling, I cannot comment on the main part of the paper, but I would like to make a comment on the mass balance (MB) section. The statement "little mass balance information ... is available" is certainly right for the whole region, especially in terms of processes. Caidong and Sorteberg (2010) is cited as one of the few available studies on MB processes, however this study is not based on measurements from the glacier surface. If you plan to use a more sophisticated formulation for MB in future research, two recent papers using on-site data might be

helpful (Mölg et al., 2012; Zhang et al., accepted).

I'm saying this because my overall impression is that the formulation of the surface MB is very simplistic compared to the ice flow formulation. Especially if you model future scenarios, it is hard to justify that statistical parameters, which incorporate many complex MB processes in a few numbers, remain constant in the future climate.

I hope my comment is helpful for your further research.

Kind regards, Thomas

Caidong, C., Sorteberg, A.: Modelled mass balance of Xibu glacier, Tibetan Plateau: sensitivity to climate change. Journal of Glaciology 56: 235-248 (2010).

Mölg, T., Maussion, F., Yang, W., Scherer, D.: The footprint of Asian monsoon dynamics in the mass and energy balance of a Tibetan glacier. The Cryosphere 6: 1445-1461 (2012).

Zhang, G., Kang, S., Fujita, K., Huintjes, E., Xu, J., Yamazaki, T., Haginoya, S., Wei, Y., Scherer, D., Schneider, C., Yao, T.: Energy and mass balance of the Zhadang Glacier surface, central Tibetan Plateau. Journal of Glaciology (accepted).

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