

## ***Interactive comment on “A Close Observation to a Typical Continental Valley Glacier Surge in Northeastern Pamir” by X. Yao et al.***

**X. Yao et al.**

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Dear Doc. Shuangguan:

Thank you very much for your detailed and veteran discussion to improve this manuscript (tc-2015-235). We tried our best to improve the manuscript in the light of your suggestions, our reply is given below

(1) As referees repeated emphasis at many sentences, the velocities of surge and quiescent are the worst questions. Answer: The advices of using "cosi-corr" method to measure velocity is a perfect idea, we accepted this advice and promoted it by using the SAR offset-tracking method to extract the velocity, which calculated the more accurate and reliable velocity, and avoid the influence of the clouds comparing with the optical images. The new Sentineal-1 SAR data was used to do a high frequent offset-tracking

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measure for ten periods during Feb. 2015 to April 2016, the results can not only get the velocity of surge (up to 10m/d) and infer the surge process. Meanwhile, it is the strong evidence to decide the surge start time.

(2) The second is volume. Volume change or ice transportation is key signal to show the “reservoir” and “receiving” area. However, the authors just calculated the ice volume. No any information showed the ice movement from reservoir area to receiving area. I have to say the volume section is useless or few useful to this manuscript. Answer: The volume is difficult to precise measure. Some researcher to measure it by employing the difference between stereo images pre- or after surge, DEM, topographic map, and field survey et al.. For making up the volume defect in this paper, addition to the previous work, we try to collected another field survey data on Aug. 24, 2015 and interpret a 2-m resolution GF1 optical RS image on Oct. 16, 2015. Those new works as well as the process of surge measured by Offset-tracking SAR method, can be effective to calculate the volume change.

(3). The third is term. For example AAR(no RAA); debris covered ice (no Back ice); seracs (no ice forests) and so on. Answer: Thanks very much for giving the glacier term revise, the most term will be accepted by the authors except the special words will be used according to the context.

The forth: Development process is the biggest inexplicability. Answer: As above stated new study date obtained during the open discussion period, development process will be presented newly.

Some specific comments also will be considered in the revised manuscript. And the authors is grateful to the referee D.Shangguan, and well come other community members continue to give more constructive comments to this paper for well presenting the scarce continental glacier surge.

Please also note the supplement to this comment:

<http://www.the-cryosphere-discuss.net/tc-2015-235/tc-2015-235-AC1-supplement.pdf>

Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2015-235, 2016.

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