

Interactive comment on “Long-range terrestrial laser scanning measurements of summer and annual mass balances for Urumqi Glacier No. 1, eastern Tien Shan, China” by Chunhai Xu et al.

Anonymous Referee #1

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Chunhai Xu and colleagues present a detailed reanalysis of annual and seasonal glaciological and geodetic balances at Urumqi Glacier No. 1, eastern Tien Shan, China, obtained between 2015 and 2017. This study puts a terrestrial laser scanner (TLS) dataset with high spatial and temporal resolution over the period of record at its value. The comparisons of geodetic results with the glaciological balances from an in-situ network are carried out in a thorough way and include an error assessment according to international practises.

The authors mentioned two publications using similar methods (Xu, C., Li, Z., Wang, F., Li, H., Wang, W., & Wang, L. (2017), doi:10.1017/jog.2017.45 and Xu, C., Li, Z., Wang,

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P., Anjum, MN., Li, H., & Wang, F. (2018), doi:10.1016/j.coldregions.2018.08.006), which can be seen as preliminary studies to the proposed manuscript. Hence, the discussion paper has been cross-read with the mentioned publications in terms of basic quality issues concerning significance, originality and novelty of the study.

Reading the papers, I had the impression that many sections are redundant. Besides the Introduction and Study site sections, the "Data and Methods" and "Uncertainty" chapters also seem to be similar, show no new insights and could at least be omitted by referencing. Furthermore, the Conclusions have redundant elements to the other two studies. Working through the manuscript new information is only provided by i) altering the temporal scale, ii) introducing an approach of density conversion and iii) the consideration of internal processes when comparing the two methods. Although the authors state that they implement a detailed comparison between glaciological and geodetic mass balances at seasonal and annual scales and assess the potential of a novel long-range TLS to monitor glacier mass balance, the obvious redundancy puts the manuscript on the fringe of acceptance.

Weighing up these points, I think that the new information provided in this Discussion paper is not sufficient or suitable for publication.

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