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Interactive comment on "Mapping and inventorying active rock glaciers in the Northern Tien Shan (China) using satellite SAR interferometry" *by* Xiaowen Wang et al.

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1. general comments - an initial paragraph or section evaluating the overall quality of the discussion paper After more than two decades silence, this manuscript offers us new knowledge, evidences and research methods about rock glaciers and permafrost distribution in the Northern Tien Shan of China. The paper based on 261 active rock glaciers which were recognized by combines SAR interferometry and optical images from Google Earth, give a detail discussing of their locations, geomorphic parameters, and down-slope velocities, and marking permafrost lower limit. This research is reference significance for alpine Periglacial landform research and permafrost mapping in the remote regions.

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Discussion paper

2. specific comments - addressing individual scientific questions/issues (1) recognition of rock glaciers: According to the manuscript and the supplement, most of the 261 active rock glaciers were correctly identified, yet some misreading appeared, for example, ARG 70, ARG 131 should be MARG. By the limitation of satellite data and research technique, a large number of small rock glaciers are not identified and compiled, especially the talus derived. For example, rock glaciers in the head water of Urumqi River reported by Cui and Zhu (1989), Zhu (1992), Zhu et al (1992), Liu et al (1995), not mentioned by the authors. ARG 94 was recognized as TARG, in the same way, site a (43.6429°N, 85.4292°E;) and b (43.6380°N, 85.4284°E) should be TARG. This greatly reduces the accuracy of number, regional and altitude distribution of the rock glaciers. This therefore, affect use of active rock glacier to determine permafrost lower limit. (2) identification of the initial line point (ILP) and front line point (FLP): It is not very clear how to determine ILP for talus derived rock glacier, for example ARG 22, 51; and moraine derived rock glacier, for example ARG 50, view Google Earth, the ILP located at moraine covered glacier. Some MARG mentioned in the manuscript, both ILP and FLP might be misreading, for example, ARG 95, the ILP is at glacier, the FLP should be down slope at 43.6226°N, 85.4043°E. ARG 219, 220, and 221 seem merge ARG 157, form a combined RG, the FLP might reach forest zone – see Google Earth. (3) surface velocity: It is better offering surface velocity by several years data. In the discussion, comparing with Cui and Zhu, Zhu. (4) indication of lower limit of permafrost: Though the manuscript give detailed discussion, the estimated lower limit of permafrost is well below field survey (Qiu et al, 1983) might be caused by missing the small RGs, especially the talus derived ones. (5) references: Page 12 4.4 references suggested: Jin HJ et al, 1993, Journal of Glaciology and Geocryology, 15(1). Qiu GQ, 1993, Journal of Glaciology and Geocryology, 15(1). Zhao L et al. 2010, Journal of Glaciology and Geocryology, 25(2).

3. technical corrections - a compact listing of purely technical corrections. technical corrections: typing errors, typographical corrections, etc. * page 3 line 77-78: “There is a lack of studies on surface velocities of rock glaciers or an inventory containing the

locations of the surveyed rock glaciers." See Cui and Zhu 1989. * page 4 line 97 (Zhu et al., 1992b) should add now reference. Zhao L et al. 2010..... * page 4 line 102 "(Cui and Zhu, 1989; Zhu et al., 1992a, 1992b; Liu et al., 1995)" - (Cui and Zhu, 1989; Zhu, 1992a, Zhu et al, 1992b; Liu et al., 1995) * page 6 line 151-152 "Debris-covered glaciers are usually covered with uniformly thin debris layer, whereas rock glaciers' debris cover is less homogenous and coarser." – what is the basis? * page 10 line 239 "IPLAs" ?! not mentioned in the text. * page 11-12, 4.3 Surface velocities of the active rock glaciers Reference Cui and Zhu, 1989 * page 17 line 442-444 The paragraph (4) seems could be omitted. * page 17 line 446-448 "This inventory offers a baseline dataset for the further investigations on permafrost modeling, slope stability, and water resource, etc." – why slope stability, and water resource? Not mentioned in the text.

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