

#Reply to editor

Dear McKenzie,

Thank you very much for handling and check my manuscript.

I have checked the order of the authors' first names and last names. They are arranged with the given(first) name first, followed by the last names.

I added Table 1 as suggested by Reviewer #1. Accordingly, I have revised the numbers of the other tables. I have also changed Fig. 1a to Fig. 1b in Line 161.

I have also carefully revised the formatting of the reference list. I have also arranged the reference list in alphabetical order. Accordingly, Cook et al. (2017a) has been changed to Cook et al. (2017b), and the corresponding citation in the main text has also been revised. In addition, I have updated the reference information for the paper that has now been accepted (Ueda et al, 2025b > Ueda et al, 2026a).

Reply letter to reviewer #1

Thank you for your valuable comments. I wrote my reply in blue.

Your comments: I would like to thank the authors for their thorough response to my previous comments and for the revisions made to the manuscript. The authors have appropriately addressed my review comments. I only have a couple of small, technical comments:

>Thank you for your checking my revised manuscript.

Your comments: Given that this paper conducted extensive field observations from 2022 to 2024, including ice density profile, ice temperature profile, broadband albedo, light-absorbing particles (Mineral dust, Organic matter, Black carbon), ablation rate of the glacier, and spectral albedo. Moreover, the specific observation items varied across different years and observation sites. Therefore, it is recommended that the authors add a table in Section 2.2 to summarize all observation items, specifying the exact observation locations, times, and sample quantities.

>Thank you for your nice recommendation. I have added below table for observation items as Table 1. And I have changed the number of tables in the manuscript.

Table 1. Summary of observation items, locations, observation periods, and sample quantities.
BB albedo: broadband albedo; MD: mineral dust; BC: black carbon; OM: organic matter.
Parentheses indicate the year of acquisition.

Observation item	Location	Year	Date / period	Time / interval	Sample quantity
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			Jul. 3–11		
			(2022);		
BB albedo	ST1c–ST5r, 2–10 sites around each stake	2022–2024	Jul. 4–Aug. 8 (2023); Jul. 22–Aug. 2 (2024)	11:00–15:30 LT;	39(2022), 44(2023), 42(2024) sites 5 measurements/site
MD and OM	Same sites as BB albedo	2022–2024	Same as above	After BB albedo measurement	39(2022), 44(2023), 42(2024) samples
BC	Same sites as BB albedo	2024	Jul. 22–Aug. 2	After BB albedo measurement	41 samples
Ice density profile					
(Shallow ice cores)	ST2c, ST3c	2023	July	—	2 cores (one core/site)
Ice temperature	ST2c, ST5r	2023	Jun.–Aug.	Every 15 min	—
Spectral albedo	ST2c, dark and clean surfaces	2024	Jul. 24	—	5 measurements/condition
Ablation	ST1–ST5 stake network	2022–2024	Melt season	~5-day interval	3 stakes/site (ST1c–ST4c); 2 at ST5r
Humic/fulvic acids	Ablation area	2022 and 2023	Jul. – Aug.	—	<53 and 53–150 μm fractions
X-ray diffraction (XRD)	ST1c–ST5r	2022	July	—	One sample /stake

Your comments: Line 160-161: “Debris from the nunatak accumulates and forms dark longitudinal stripes in the ablation area (Fig. 1a)”, This statement is inconsistent with Figure 1. Should it be Fig. 1b ?

> Yes. Thank you for your careful check. I have revised from Fig. 1a to Fig. 1b at Line 161 in the revised manuscript.