We thank the reviewer for the careful reading of the manuscript and for the constructive comments and suggestions. We have revised the manuscript accordingly and believe that the changes have improved the clarity and presentation of the work.

Below we provide a detailed, point-by-point response to all comments. The reviewer's comments are reproduced in *black indented text*, and our responses are provided in blue font. All corresponding modifications have been incorporated into the revised manuscript.

Detailed comments to the paper
*"**Water flow timing, quantity, and sources in a fractured high mountain permafrost rock wall**" by Matan Ben-Asher, Antoine Chabas, Jean-Yves Josnin, Josué Bock, Emmanuel Malet, Amaël Poulain, Yves Perrette, and Florence Magnin*

<u>*Moderate comments.*</u>
1. *Introduction. While the introduction section is quite detailed and includes relevant references. I think it lacks a clear and detailed statement of the focus of the paper. For example, the Mont Blanc Massif area is mentioned at lines 85-89. However, it is not clear at this point that this will be the study area. I suggest expanding lines 85-93 and clearly state here the objectives of the work and the study area. Additionally, this paragraph should include a description of the structure of the rest of the paper, highlighting what is included in sections 2-6.*

We thank the reviewer for this comment. We have revised the final paragraph of the Introduction to clearly state the study area, explicitly define the objectives of the study, and briefly describe the structure of the manuscript (Lines 90–97).

2. *Lines 260-274. This paragraph is not very clear. I suggest defining the temporal lag from a mathematical standpoint instead of giving examples (i.e., "at a lag time of +6 h, the flow series was correlated with the AT series shifted forward by 6 h"). I suggest including some references to support the use of such cross-correlation analysis based on Pearson Correlation Coefficient. Before the cross-correlation analysis, data are filtered to remove high-frequency noise (lines 272-274). The moving average window size is set as 1h, i.e., it coincides with the minimum temporal lag. How does this smoothing impact on the results? Why do you set a threshold on the maximum flow rate to select days included in this analysis (line 273)?*

We thank the reviewer for this comment. The cross-correlation analysis section has been revised to include a formal mathematical definition of temporal lag, additional references supporting the method, and clarification regarding the effect of smoothing and the rationale for applying a flow threshold (Lines 266–282).

3. *Lines 585-603. These lines list your main findings. Otherwise, key points included in the Discussion section are not exhaustively summarized here. I suggest restructuring this part of the Conclusions, including the interpretation of the experimental results and maybe reducing the total number of bullet points for the sake of clarity.*

We thank the reviewer for this suggestion. The Conclusions section has been revised to better synthesize the main results and their interpretation, and the number of bullet points has been reduced from eight to five for improved clarity (Lines 594–609).

Minor comments.

1. Line 126. The reference to "Figure 2" is repeated twice in the sentence. We deleted the repeating reference to Figure 2.

2. Line 136. "Lines" should be "lines". Changed to noncapitalized "lines".

3. Figure 3, legend. Acid Amino-G should be Amino Acid G. Corrected the legend text.

4. Line 161. There is an extra "the" before 11 May 2022. Omitted "the" from the text.

5. Line 167. Missing reference. Reference corrected.

6. Line 199. There is a missing space after the comma and an extra space before it (should be "weekly,"). Corrected.

7. Line 210. What do you mean by "sampled occasionally"? Specify the actual sampling Frequency. Changed to "…were sampled six times in 2022…"

8. Line 215. Specify excitation and emission wavelength used for detection of fluorescence signal. Added: (AAG ex:305 nm/em:447 nm, SRB ex:555 nm/em:577 nm, FLC ex:490 nm/em:510 nm).

9. Line 227. Are data linearly interpolated? Please specify for clarity. Yes. Added "linearly interpolated".

10. Line 253. What do you mean by "flow characteristics"? Changed to "flow rate".

11. Line 303. Specify "iButtons temperature sensors". Updated to "miniature temperature sensors (iButtons) ".

12. Line 305,306. There is a typo: "Sulphorodamine-B". Corrected.

13. Line 353. There is a typo: missing space between "significant" and "insulating". Corrected.

14. Line 354. There is a typo: missing comma after "i.e.". Added "i.e.,".

15. Line 356. The reference to Figure 5 is repeated twice in the same sentence. We deleted the repeating reference to Figure 5.

16. Line 378. There is an extra "the" before "24 June". We deleted the extra "the".

17. Supplementary. Consider reducing fonts of figure titles. We reduced the font size from 35 to 14.