Review **egusphere-2025-832** *"Calorimetric in-situ determination of ice water content in two Alpine glaciers"* by Lüthi et al.

This article presents two experiments and associated modelling to determine in situ water content. The experiments were carried out in an ice cave and at the base of the Argentière glacier. Both measurements showed water contents of between 1 and 2%. Despite the interest of the results presented, my general feeling is that this article suffers from a too rapid writing, with many typos and important informations missing to fully understand what is being done, particularly with regard to modeling.

I have compiled a list of comments below that I hope will help improve the current manuscript (listed in order of appearance).

- line 7: and form -> and from
- line 42: has a analytical -> has an analytical. The analytical model assumption should be presented in more detail. I guess it is based on an infinite medium, with spherical symmetries? Is the water content included in the analytical model? I am not sure that the analytical solution should be presented here, it would better fit in the method section? The erf function should be defined (at least mention that it is the Gauss error function). Motivate the interest of presenting this analytical solution with what is done after.
- line 51: with an finite -> with a finite
- Figure 1: this figure could be improved by adding a few dimensions. Also, it's not clear why there are two heads drawn?
- Caption Figure 2: d' Argentière -> d'Argentière (remove space)
- line 64: number of figure missing
- section 3.3: What is really solved by the model should be presented. Which parametrization is used for exemple for the parameters dependency to temperature and water contents? What is the geometry of the domain (half a cylinder?). If it is half a cylinder (as shown on Fig. 3), what are the boundary conditions applied on the plane? What are the dimensions of the model domain? What is the size of the element where the cooling is applied. Is the cooling temperature enforced at only one node or over a small volume? It is mentioned that the cooling temperature is either constant or driven by the measurement, but the difference between the two approaches is never mentioned in the results section.
- Figure 3: There is no "Top" panel in this figure; after after, there is no (a) or (b) indicated in the two panels. The colorscale indicates a minimum temperature of -2 whereas the caption mentions -10 for the blue colors.
- line 107: why not give the exact measured position of each temperature sensor?
- Figure 4 (and other similar figures): I would suggest to have one color for each sensor instead of having a color function of the distance to the cooling head. The given distance should be the measured distance, not the expected one, as it has been measured on the field. On the right panel, what represents the top orange curve? It is not possible to see on the two

panels the dashed orange curve of the model. Why? As you are comparing two features on these curves (arrival time of the cold wave and shape of the curves), I would suggest to put a marker for the arrival time of the cold wave to really emphasize the difference between the model and the experiment. There is no label A and B on the panels.

- line 130: with at?
- line 132: what is the effect of a large crystal in comparison to small crystal? May be you should explain where the water is stored in temperate ice such that the reader can understand your point?
- line 134: the an?
- line 145: such at Glacier?
- line 153: as well as Alpine Glaciers -> as well as at the Argentière glacier OR as well as in an Alpine glacier.
- Figure A1: what is the difference between the two panels? What is the model and what is the analytical solution?
- Figures B2 and C2: give the differences between the different experiments, else the comparison is useless.
- Figures B1 and C1: mention in the caption that the panels for a water content of 1 and 2% are identical to the figures in the main text.
- line 172: We than -> We thank