The authors present a new indicator for glacier monitoring: the Glacier Loss Day (GLD), i.e. the day of the hydrological year when the mass balance of a glacier becomes negative. They computed the GLD on Hintereisferner for the hydrological years 2020, 2021, and 2022 and discussed differences among the three years with a focus on the extreme mass loss of 2022.

The study is clear, concise and easy to read. In the following, there are a set of minor comments and questions.

General comments

L49-54: In this part of the methods, more details on how you derive the elevation change are needed. How do you fill the voids in the DEMs since the average coverages in the DoDs are around 50%? Do you interpolate? If yes, what kind of interpolation?

L59-66: To convert from volume change to mass change is not the "density" necessary, but the "density of volume change". This is something different, since it depends on compaction of the snow/firn layer and its change over time, and not simply, as said, on the surface density of the snow. Please describe better if you use the “density” or the "density of volume change". Furthermore, it is implied (at line 64) that the density distribution is "similar". How do you know that? Are there spatial measurements available, or is it an assumption?

Please provide uncertainty values of the mass balance (e.g. L2 and elsewhere) and in Fig. 2.

Specific comments

Introduction

L16-17: “By reaching a GLD, the glacier obviously leaves the state of balance with the environmental conditions.” → Is the glacier in balance before the GLD? Or it is actually in balance only at GLD when the mass balance is zero? Or what kind of balance is meant here? Consider rephrasing or omitting.

L21-22: “Cremona et al. (2022) upscaled the mass loss on three Alpine glaciers from automated ablation stake readings at one point to the full glacier area by applying a mass balance model.” → Cremona et al. 2022 upscaled mass balance from different point observations, to the scale of the entire Swiss Alps. From this sentence it is not clear 1), weather there is only one or more point observations, and 2) if “the full glacier area” is meant at regional scale or only for the three glaciers. Consider rephrasing.

Fig. 1: It could add value if you make the comparison with other European countries, you could for example reference this link: https://doi.glamos.ch/figures/probability_glacier-wide_annual.pdf
or the GLAMOS data:
GLAMOS (2022). Swiss Glacier Mass Balance, release 2022, Glacier Monitoring Switzerland, doi:10.18750/massbalance.2022.r2022.
https://doi.glamos.ch/data/massbalance/massbalance_2022_r2022.html

Data and Methods

L46: “Given the scanning geometry of the system, around 67% of the glacier area is covered, but this slightly varies over time and glacier conditions.” → Which factors cause the area coverage to vary and what is the range in which this vary?

L57-58: “The first day of the melt season is defined as the first maximum after 1 May that is followed by seven consecutive days of surface elevation decrease of at least 4 cm day−1.” → Not clear to me the maximum of what. Is it the highest positive mass balance? Consider rephrasing. Is the first day of the melt season defined by you? If so, consider rephrasing to “We defined…”. If not, cite literature where this is defined.

L61: “The AAR on HEF at years with equilibrium mass balance conditions of +-100 kg m−2 is 0.69, […]” → Here you mean the AAR on HEF at GLD right? If so consider rephrasing like “The AAR at the GLD on HEF at years…” or similar.

L62-63: “In the hydrological years of this study, the snow-covered area at the GLD is also approximately 69%, observed from the time-lapse cameras.” → How do you compute the snow-covered area? Is it a qualitative estimate or what method do you use?

Results and discussion

L73: “The winter mass balance of 2022 was 47% below the decadal average of 2011-2020.” Is the winter mass balance calculated for the same date in both cases? Or how is that homogenized?

Summary and conclusions

L109-110: “In 2021/22, the low winter accumulation, the early start of the ablation season, and the surface elevation change rate define the early GLD and give way to a long ice ablation period.” → Actually, the surface elevation change rate before the GLD is lower in 2021/2022 than in previous years. Stated as it is, one could conclude that a lower rate can also contribute to longer ablation period, which is not the case. Consider rephrasing.

L115-119: “Nevertheless, we are aware that a setup such as at HEF is unique and only feasible on specific glaciers. However, with ongoing developments in glaciological and geodetic measurements, mainly with automated ablatometers (e.g. Cremona et al., 2022; Carturan et al., 2019; A2 Photonic Sensors, 2022), uncrewed aerial vehicles and the increasing availability of highresolution satellite data in conjunction with modelling approaches (e.g. Landmann et al., 2021), the GLD of other glaciers can be studied and communicated in the future.” → Landmann et al. 2021 developed the stake setup and Cremona et al. 2022 developed the algorithm for the automated reading. Therefore, it is more appropriated to cite Landmann et al. 2021 beforehand (e.g. “…mainly with automated ablatometers (e.g. Landmann et al. 2021; Cremona et al., 2022; Carturan et al., 2019; A2 Photonic Sensors, 2022)”). Furthermore, in Landmann et al. 2021 they don’t use UAVs nor satellite data. Please rephrase.