The paper “High-resolution Digital Outcrop Dataset of a Fossil Hyperextended Rifted Margin, Swiss Alps” presents an impressive (in scale and extent) and interesting set of digital outcrop models covering well exposed low angle normal faults in the Swiss Alps. The combination of interesting geology and alpine geomorphology (including several landslides and glaciers) will make the dataset of interest to a diverse audience in both research and teaching.

All of the data (including, importantly, the raw drone photographs) are available and well documented in FAIR data repositories. I would thus suggest that the manuscript could be accepted in ESSD following the minor revisions outlined below.

General comments:

1. The start of the paper could emphasize more the diverse applications of this dataset (structural geology, sedimentology?, geomorphology, glaciology, teaching?) to ensure it reaches a diverse audience.
Agreed. The introduction has been significantly modified following Reviewer 1 and your comment.
We added this sentence to the introduction: “The dataset includes high-resolution photogrammetric imagery together with derived DOMs and geospatial products, offering broad applications in structural geology, three-dimensional geological interpretation, quantitative outcrop analysis, comparison with seismic data, and studies of landscape evolution.”

2. The description of low angle normal faults could be improved, and ideally written for a somewhat more general audience (matching the previous comment) — especially given their relative novelty and impressive scale.
We added these sentences to define the Low angle normal faults to a general audience: “Low-angle normal faults (LANFs) are characterized by a dip of less than 30° associated with displacement of several dozen kilometers often exhuming often deeper rocks. These extensional structures accommodate significant crustal and lithospheric deformation, and their geometry and role in continental rifting remain the subject of ongoing debate.”

3. If possible, please also include validation / field data (e.g., field notes, compass measurements of structure orientations) in the open dataset, as these are invaluable if used for further research.
These will be included as part of a forthcoming paper currently in preparation for Tectonics. This paper will be based on the analysis of the dataset and field data acquired using conventional methods, and the additional data sets will be made openly available following publication. We therefore believe that including these field observations is beyond the scope of this submission.

4. Please revise the manuscript to tighten the language/writing and ensure clear and engaging narrative flow.
The text has been modified accordingly.

Specific comments:
Line 80: Please forgive my ignorance, but how did these low-angle structures avoid reactivation during alpine compression and associated thrusting? I imagine the explanation is worth at least a sentence or two.
We added this sentence: “The preservation of these low-angle normal faults is partly related to their orientation relative to the Alpine compressional, which did not systematically favor their reactivation as thrust faults. In addition, the complex three-dimensional geometry of the former rifted margin and the heterogeneous distribution of Alpine deformation contributed to the preservation of these inherited extensional structures.”

Line 95: Why manual focus? For most UAV cameras auto- or fixed (infinite) focus should be sufficient?
Indeed, auto-focus was used throughout the acquisition. However, it was frequently "refreshed" to correctly adjust to the shifting distances between the UAV and the outcrop during the flight (which was not always picked up by the sensors correctly). This has been further clarified in the manuscript.

Line 99: Is 0 degrees vertical (NADIR) or horizontal?
We now precise in the text: The vertical camera angles varied between 0° and 60°.

Table 1: Please add a scale corresponding to the approximate GSD (calculated from camera to outcrop distance) to the bottom of the "Distance camera/outcrop (normalized)" column.
The table has been modified accordingly.

Line 125: Delete this paragraph ;-)
The text has been removed.

Line 136: It would be worth commenting here on the georeferencing accuracy of the SwissALT3D products?
We added the information in the text: "The vertical accuracy of the SwissALTI3D dataset varies depending on elevation and the data acquisition method, with an estimated uncertainty of ±30 cm below 2000 m for recent LiDAR-derived data, ±50 cm below 2000 m for stereo-correlation data, and approximately ±1–3 m above 2000 m; manually updated areas based on measured points, breaklines, and surfaces exhibit mean deviations ranging from approximately 25 cm to 1 m (Swisstopo 2022a)."

Line 230: Clarify that some (many?) of these deviations could be real topographic change?
We added this sentence to clarify: "Although some of these deviations may result from differences in acquisition conditions and processing between the datasets, others may reflect genuine topographic changes that occurred between the respective acquisition dates, particularly in dynamic environments such as glaciers, snow-covered areas, lakes, and erosion-prone slopes."

Line 295: Double check this - I would imagine the errors you report are nearly 1 order of magnitude higher than a typical RTK direct-georeferencing survey (30cm to 1 m vs ~1-30 cm).
We removed this sentence..

Line 332: Consider mentioning here the benefits of converging imaging geometries (e.g., flying around a target imaging obliquely) vs planar or diverging views (errors tend to cancel during the bundle adjustment, improving the robustness of the solutions; see some of the papers from Mike James on the role of imaging geometry).
We added this sentence: "In contrast, UAV acquisitions can provide convergent imaging geometries, with oblique images acquired from different viewing directions around steep terrain, providing complementary perspectives that can reduce systematic errors and improve the robustness of the photogrammetric reconstruction (James and Robson, 2014)."

Line 365: This sentence could be reworded for clarity: how does limited variability in color or texture reduce risk of incorrect interpretations? I don't follow the logic.
We rephrase the paragraph: "Textureless domains are visible along ridges and steep peaks and correspond to artefacts generated during reconstruction in Agisoft Metashape. Variations in cloud cover, causing shadows and changes in illumination, can also affect the quality of the models, as illustrated by the color discontinuities observed between and within some DOMs, such as model 12 (Figure A11). In the FATDOM dataset, these color and texture

variations are generally spatially limited and can be identified as acquisition or reconstruction artefacts. They therefore have a limited impact on the interpretation of larger-scale geological features, such as distinct lithologies (e.g. basement versus sedimentary rocks) or regional tectonic contacts (e.g. LANFs, as illustrated by model 11 in Figure 3, and Alpine thrusts, as illustrated by model 3 in Figure A3).”

Line 425: This whole paragraph would fit better in the results section rather than the discussion.

We thank the reviewer for this comment. A similar point was raised by Reviewer 1. We reorganized the section “Usability of the dataset” by integrating the presented applications into the corresponding subsections of the Results section: 4.5 Preliminary results from the dataset (4.5.1 3D geometry of Low-Angle Normal Faults and 4.5.2 Use in geomorphology: monitoring deglaciation). In the Discussion, we kept the part 5.3 Geological implications of DOMs and comparison with seismic data. These subsections provide only examples and would require further investigation. Therefore, we believe that it is more appropriate to retain it in the Discussion, as it focuses on the broader geological interpretation and implications of the results.

Line 485: Are there other photogrammetry based studies / datasets covering these glaciers? Worth noting / briefly reviewing these if so.`
To our knowledge, no photogrammetry papers have studied these glaciers.

Line 513: Also mention CloudCompare?
The text has been modified accordingly to include CloudCompare.

Further minor suggestions are included in the annotated PDF.
The recommended changes have been incorporated throughout the text where applicable.