Dear Anonymous Referee #2,

Thank you for your review. We found your comments very constructive and believe that they will significantly strengthen the quality and clarity of our paper.

We have provided answers to your comments (your comments in bulleted italics) below:

- *The topic—avalanche hazard assessment for freeride skiing areas—is relevant for mountain risk management. However, the scientific contribution and methodological soundness are questionable. The study mainly combines existing approaches (Biskupič & Barka model and RAMMS simulations) without introducing a clearly defined methodological innovation. Furthermore, the validity of the approach for freeride-scale avalanches is uncertain, given the limitations of the applied model and the arbitrary selection of simulation parameters.*

We agree that our primary goal was not to develop a new model, but to clearly demonstrate and thoroughly measure how two established approaches can be used together in the specific context of *freeride* avalanche management. The combination of presented approaches was utilized in the past, however frequency estimation based on Biskupič and Barka model and RAMMS:Avalanche is new in our region. By full integration of aforementioned approaches we wanted to create a replicable framework for the objective and standardized assessment of local avalanche hazard at the scale of freeride terrain.

Regarding validity, we acknowledge the limitations of the RAMMS::Avalanche model when applied to small avalanches and therefore recommend the use of the more appropriate RAMMS::Extended model for future applications. We do not consider the random selection of release zones to be as problematic, as most of these release areas were identified only within regions marked as prone to release by the Biskupič and Barka model, and they also corresponded with the inventory produced by Milan, which was created based on expert assessment.

- *Starting points for avalanche simulations were selected randomly rather than defined by expert judgment or objective terrain analysis. This introduces significant uncertainty and undermines reproducibility and physical realism.*

We will substantially strengthen and refine the section on model limitations in the discussion.

After correction, we will explicitly state that we do not interpret the results of simulations as precise predictions, but rather as a pilot study (proof-of-concept) for spatial risk analysis, rather than for a calibrated prediction of avalanche runout.

- The RAMMS model version used (RAMMS:Avalanche) is not calibrated for small, skier-triggered avalanches (≤ size 3), which are the focus of this paper. The authors acknowledge this limitation but still base their conclusions on these simulations. No clear uncertainty or sensitivity assessment is provided. The validation (82.61 % overlap with cadastre) does not adequately measure model performance because both datasets may contain inherent spatial inaccuracies. Consequently, the results appear qualitative rather than quantitatively validated, and the methodology cannot be confidently generalized to other mountain areas.

We will emphasize that our study is intended as a pilot study (proof-of-concept) for spatial risk analysis, rather than a calibrated prediction of avalanche runout. The primary objective is to demonstrate and explore how existing modeling approaches can be applied in combination to assess relative spatial risk patterns. Consequently, our conclusions are based on relative, scenario-based outputs that illustrate potential hazard extents, rather than on precise predictive modeling of individual avalanche events. For

future work, which would utilize optimized model, we will recommend applying a more appropriate model, such as RAMMS::Extended, to improve accuracy of simulated run-outs.

We will completely remove the statement claiming 82.61% 'model performance validation.' Instead, in the Results section, we will refer to a 'spatial comparison with historical occurrences.' This comparison is intended solely to illustrate that the simulated runout zones correspond to areas where avalanches have historically occurred. In this case, the overestimation of run-outs by RAMMS:Avalanche does not impact the validity of the study, as it only illustrates the possibilities of integration of two models rather than a calibrated prediction of avalanche runout. Nevertheless, an uncertainty assessment of datasets, as well as, input data (DEM, vegetation data and avalanche records) will be added to the discussion.

We agree that the results are primarily qualitative/relative. This will be clarified in the Discussion. The methodology will explicitly state that the conclusions are based on relative spatial risk values intended for showcasing the possibility of model combination.

- *The methods section provides many technical details but lacks a clearly structured, reproducible framework. Input data processing steps (DEM manipulation, vegetation classification) are described in detail, but the logical reasoning behind parameter choices is missing. The linkage between model inputs, assumptions, and outputs is weak. The approach's transferability to other freeride areas is not convincingly demonstrated.*

We acknowledge the lack of reproductible framework, therefore, we will reorganize the Methods into a step-by-step workflow that explicitly links data inputs, parameter choices, modeling assumptions, and resulting outputs. We will add explicit reasoning for all key parameter selections (e.g., DEM preprocessing steps, vegetation classification thresholds, and release-zone criteria). The revised text now clearly explains how each input and assumption influences the model behavior and the resulting spatial risk patterns. We will add a subsection to the Methods that describes in detail the input criteria and GIS data-processing steps, which can be readily replicated in other mountain regions provided that DEMs, vegetation maps, and avalanche records are available.

- *The discussion repeats descriptive results without deeper analysis or critical interpretation. It acknowledges model limitations but still presents the findings as reliable, which is inconsistent. The conclusion should explicitly state that the current model configuration has limited applicability to freeride conditions, rather than suggesting general adaptability.*

In the Discussion, we will remove descriptive repetition and add a more critical evaluation of the results. We will clearly distinguish between what the simulations can reliably indicate (relative spatial patterns of potential hazard) and what they cannot provide (precise runout predictions for small, skier-triggered avalanches). We will emphasize that the outputs should be interpreted as scenario-based approximations rather than reliable event-level predictions. Lastly, the conclusion will be rewritten to explicitly state that the current model configuration has limited applicability to freeride conditions, unless RAMMS:Extended is used for accurate run-out modelling.