

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2022-32

Anonymous Referee #2

Referee comment on "Delimiting rockfall runout zones using reach probability values simulated with a Monte-Carlo based 3D trajectory model" by Luuk Dorren et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2022-32-RC2>, 2022

This study provides a reach probability threshold value for delimiting rockfall runout zones based on trajectory simulations and recording of rockfall events at 18 sites in Europe. The objective was to generate standardized reach probability threshold values that help with separating realistic from unrealistic simulated rockfall runouts. The findings can potentially contribute to quantitative assessment of rockfall hazards. I recommend publication provided that the following comments are addressed.

Fig 2 – Consider adding field photos for each topography type above or below the panel. Add image resolution/source.

Fig 3 – delete the word "ancient" or define it.

I suggest somewhere in section 2.2 include some references to previous work using Rockyfor3D model to assess rockfall hazards. How does this study build on previous efforts using this model?

Line 104 – The model requires the number of trees – Does this include tree density/spacing? If no, how does this may impact your model?

Line 121 – Explain why micro topography should not be taken into account when assigning surface roughness values. Small topographic or morphological irregularities may influence rockfall trajectory. How is this considered in this study?

Line 149 – Include a few references here.

Line 158 – Assuming that these SW are fragments of larger blocks might work for some slopes, but it may not be entirely correct for vertical/steep cliffs where detached rockfalls may not interact with the slope (wall) before deposition. Did your study sites include such vertical or almost vertical cliffs?

Fig 4 – Please add units for volume on the y-axis. What are the black dots, individual rockfall events? Can you add the number of rockfalls above each yes/no box? Overall, this figure is hard to understand and needs to be properly labeled and explained.

Line 183 – Insert confidence interval for the difference so readers know what significant difference refers to.

Fig 6 – Not everyone is familiar with reading box plots. Can you label or include in caption the following: show the median value for reach probabilities of all events at all sites (1.41%, e.g., drawing this as a horizontal red line on the plot), what are the gray dots (individual SW?), highlight the boxes for Claro and Taesch (the 2 sites that significantly differ from the rest – maybe coloring them in gray). Consider adding the same labels as Fig 1 (e.g., CH1) under each site name along the x-axis. Y-axis should be labeled the same way in both Fig 6 and 7.

Fig 7 – Draw the medium line for P(reach) across the plot.

Line 192 – What do you mean by “relatively high correspondence” here? Insert values here and in fig 9.

Line 197 – Block volume?

Line 223 – Explain what you mean by “long term practical experience” or delete.

Line 224 – define what you mean by abundant data (no. of SW?)

I encourage the authors to make the rockfall data and codes used in this study available upon request or provide a link to an open-access repository where the data are stored.

