Comment on esurf-2022-21

Anonymous Referee #1

Referee comment on "Modelling deadwood for rockfall mitigation assessments in windthrow areas" by Adrian Ringenbach et al., Earth Surf. Dynam. Discuss., https://doi.org/10.5194/esurf-2022-21-RC1, 2022

In this study, the authors present an automatic deadwood generator, namely ADG, which integrates deadwood logs into rockfall simulation models. First of all, I want to emphasize and compliment the great efforts made to develop such a tool. On this basis, this research paper aims at assessing the impact of woody storm debris on the protective capacity of a forest stand against rockfalls. The results demonstrated that even after a decade, deadwood has a stronger protective effect against rockfall compared to standing trees. These results are of major interest for stakeholders in charge of risk management, and constitute appropriate basis for land-use planning.

Yet, I believe that the interest of this research in its practical use is not well introduced in the paper. I cite: "The approach serves as an effective tool in a post-event analysis. It can be used to determine the necessary amount of lying deadwood that is needed to replace the protection effect of the pre-storm forest and, more importantly, it allows for quantitative benchmarking of different silvicultural measures" but not only. Indeed, we clearly understand that deadwoods have a mitigation effect on rockfalls (which is of great interest). But for practitioners, it is not a mitigation strategy that can be easily adopted. Indeed, practitioners cannot wait for the next calamity to hope, e.g., trees uprooted by wind so that rockfall risk can be reduced. Yet, an interesting point is that the protective action of the forest (through debris) is not reduced to zero after the calamity, so that practitioners can have delays for choosing/ prioritizing of new mitigation strategies (based on your results, the rockfall risk shouldn't significantly increase). In that respect, an interesting research perspective could therefore lead to know how much time it will take until the protective action from deadwoods is over (in years), so that practitioners will know the delay that they have for implementation of new mitigation strategies.

Minor comments:
- Why did you limited the study to one mass class of 400 kg or 0.15 m3? Is it related the block volumes observed on the field?
- Line 118 "To directly assess deadwood effectiveness against larger rockfall energies, the fracture impact energy of large-laboratory test data is used": if a simulated rock block impacts a tree with an energy exceeding the fracture impact energy, does it mean that

the block will continue to propagate downslope without any disruptions?
- Figure 3: The colors blend. Maybe the orthophoto (background) could be in transparency to improve the reading?

General comments:
The manuscript is clear, well written and well organized. The English language is correct (I am not a native speaker, but I did not find any issue).