Public justification (visible to the public if the article is accepted and published):
Dear Mr. Jackisch,

Thank you very much for your constructive comments and suggestions. We did our best to address every feedback and integrate the different suggestions. We are certain, that the manuscript highly profits from the valuable comments. This is gratefully acknowledged. Please find our detailed point-by-point responses to all your comments below.

Kind regards,

All authors

Dear authors,

we are pleased to accept your manuscript for publication, pending minor revisions for review by the Topical Editor. Thank you for your constructive replies to the referees.

With best wishes,
Robert Jackisch

Additional private note (visible to authors and reviewers only):
I see the point of the referee's comment regarding the brief description of the catchment scale dataset, i.e. the UAV data acquired for SfM.
While I agree with the authors that the catchment scale is a useful complement, please provide some reference towards their use case at broader scale but coarser spatial resolution, to satisfy the need for some insights for the added benefit towards erosion features, as suggested by the referees.

Response: While our data focuses on the micro-catchment scale with a ground sampling distance of 2 cm, its 'added benefit' for coarser spatial resolution models is twofold: On the one hand, coarser models rely on simplified empirical factors to account for surface roughness, rill formation, and sediment connectivity. Our data provides the high-fidelity structural detail necessary to derive and validate these sub-grid parameters, ensuring that the physical processes occurring at the small scale are accurately represented in upscaled model versions. On the other hand, larger-scale models often struggle to differentiate between inter-rill and rill erosion. By providing a 'nested' view, our dataset allows modelers to test how well coarser models capture the initiation and propagation of erosion features that eventually contribute to catchment-wide sediment yields. To address this in the manuscript, we have added a discussion of how this high-resolution input serves as a 'bridge' for coarser regional assessments, citing the need for multi-scale validation as highlighted by researchers like Borrelli et al. (2021) and Panagos et al. (2015) who operate at larger scales but acknowledge the

necessity of high-resolution catchment data for process-based accuracy.

- As previously mentioned, Section 2.1 is quite short in comparison to chapters 2.2 and 2.3.

Response: Indeed, this section is shorter as we provide a lot less – especially unique/novel – data. We would like to keep it this way.

- If not described in adjacent reference to this project, please add at least the image overlap, flight speed, flight pattern, GNSS mode (RTK?)

Response: We added the information.

- the term micro-catchment is used 3x if I'm correct, but catchment 28 times. The difference is not clear, is the term applied interchangeably here?

Response: They were applied interchangeable, but as this seamed to lead to some confusion, we decided to only use the term micro-catchment. Thank you for pointing out the lack in clarity.

- Probably the text between lines 76 and 80 is confusing: "...scale by event-triggered monitoring posts and on the plot scale via SfM during rainfall simulation"

Response: Thank you for this advice. We rephrased the figure caption and used shorter sentences for more clarity.

- A small detail, the soil type described in Figure 3, if that is a German soil classification (Bodenkundliche Kartieranleitung), e.g. Ut2, therefore it requires a reference or international standard

Response: We adapted it to international standard.

- I believe the descriptions in lines 98-100 and line 143 ... "13 additional rainfall simulations were carried out at various sites in Saxony and Thuringia and under different conditions between May and 145 October 2020 (Fig. 3)" leads to the ongoing confusion. Where are those stations, are they relevant here and used, is there a reference?

Response: We included a table with date and coordination of the 19 rainfall simulations. Further information can be found in the published data. We hope this solves the ongoing confusion.

- Line 165: are 3D models estimated, or are they calculated by an algorithm. Error and accuracies etc. are estimated. Please reword

Response: Changed.

- Line 166: different perspective, how exactly?

Response: Changed.

- Please carefully check spelling also in the Data share data description document template, i.e. the institutes affiliation

Response: Thank you for highlighting this.

- Description of Figure 7, what is dense 4 and dense 438 (dense cloud? In what counting scheme)?

Response: Thank you for this advice. We changed the description towards the dense cloud before and after the event.