

Interactive comment on “Study on Mechanical Properties and Dissipation Capacity of Ring Net in Passive Rockfall Barriers” by Chengqing Liu et al.

Anonymous Referee #1

Received and published: 29 June 2018

The article handles the mechanical performance of net rings within rockfall protection nets and their numerical simulation. It therefore queues into the series of existing research on this type of nets. Based on the fact that already a lot of research exists on the ring nets I would have expected more comparison with existing research.

Specific comments: - The article uses the expression "brake rings". Please, be aware that the role of the handles brake rings are the so-called energy absorbing elements. There are not only brake rings around to perform this task depending on the manufacturer of a rockfall protection system. Therefore, I would change from "brake rings" to "energy absorbing elements".

- You are considering 2-, 4- and 6-point bending of the net rings. However, corner and edge rings in the 4-fold-ring nets are connected to 3 points. Your mechanical numerical

C1

analyses should include this setup.

- There is much more research on ring nets around as stated so far in the references. E.g. the works of Nicot in the late nineties are left out completely (use scholar.google and search for "nicot rockfall" for suitable references).

- P2L32: There are much more net types around. Have a check on the products of Trumer, Jakob, Isofer, etc.!

- P2L34: Please, add some references for destructured ring nets!

- P2L35: "ring net the" -> "ring net. The"

- P3L41: What does "foreign" mean? Your publication is meant to be read world wide. If you are interested to publish only for China then "foreign" might be ok.

- P3L43: "characterizing" -> "characterize"

- P3L49-51: This sentence does not fit in here. "Tecco" is no ring-net. Further it hasn't been described before.

- P3L52: "33% so" -> "33%. So"

- P3L62: Chain-link nets were not described before.

- P6L106: If you directly add theta with cos(theta) you should describe in which unit theta has to be used.

- P6L109: Grassl (2002) reports a different equivalent section radius. Please discuss. (Grassl, H. G. (2002). Experimentelle und numerische Modellierung des dynamischen Trag- und Verformungsverhaltens von hochflexiblen Schutzsystemen gegen Stein-schlag (Doctoral dissertation, Ph. D. Diss. Swiss Federal Inst. of Technology Zurich, Switzerland).

-P6: If you have a plastically deformed net ring (2-, 3- or 4 point tension) and you cut it at one place completely through the "ring" shape gets lost and the it snaps inwards.

C2

This shows that the deformed ring stores a lot of elastic energy. Please, quantify and discuss this part.

- P6L124: add "point" between "four" and "tension"
- P8L139: Does the bending deformation energy dissipation depend on the bending radius?
- P8L147: Please compare with the analytical solution of Nicot (see above).
- P8L175: Please, compare with the results of Grassl (2002).
- P8L181: "presented" → "realized" ?
- P11Table3: Please, explain the displacement measurements. Are they including the static sag? Are they separated from the static sag? How has the static sag been treated in simulation?
- P11Table3: What is the maximum energy capacity of this setup? Compare it with the results of Grassl(2002).
- P12L204: This section has a fundamental mismatch. If a ring net is attached to a circumferential rope, the rings can slide along the rope. This significantly changes the load bearing capacity of a ring net. Please, compare, discuss, adjust....
- P12Fig.11: Please, arrange the drawn rings as they are arranged in simulation.
- P13L231: Do you have comparable results from experiments?
- P14L244/245: Add "alpha" somewhere
- P14Fig14&Fig17: Please, be aware that manufacturer uses the ring net for typical barrier panels with rings in the four corners! This changes the load bearing capacity. Further, numbering of rows in Fig. 17 is not congruent with manufacturers numbering!
- P15Fig.15: Change "a" to "alpha".

C3

- P15Fig.16: The right figure gives the impression of a vertical barrier with no "g" acting on the net. Please, choose a different viewing angle.
- P15Table5: The destruction method is repeated identically four times. Please, adjust table to avoid this repetition.
- P16L260: "vertically" → "orthogonally"?
- P19Table6: "maximum" → "impact"
- P20L334: Please, sort the references alphabetically or use numbering if you want to keep the current order.
- P20L347: ".,:" → ".,."
- P21L361: "DANY" → "DYNA"

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-76>, 2018.

C4