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# *Interactive comment on* "FEM-based stability charts for underground cavities in soft carbonate rocks: validation through case-study applications" *by* Michele Perrotti et al.

**Anonymous Referee #2**

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I think that the submitted paper is a good work and can go further the reviewing process towards publication. It helps to understand the state of failure of the underground cavities in soft rocks and shows the application to real cases.

Nevertheless, several presentation improvements are required in before a publication : - the English level is good but long sentences are often used and not so easy to understand. The vocabulary has to be more accurate in some parts of the paper. - the general presentation can remain but : - the abstract has to be improved (mainly in the second part), - the part 1 can be resumed in the first part, but completed in the second to understand the authors' thesis, - the part 2 needs to be rewritten in a clearer

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way because the used equation is missing, the parameters are not clearly defined and mixed with the assumptions. The figures seem to be so big and numerous, and with a poor resolution : please merge the first charts figures (2, 3, 4) and keep another just show the really useful items for the paper, even step by step. It will increase the understanding. - the part 3 needs to be rewritten in a clearer way. It needs first a introductive paragraph as transition from model approach towards real cases. It could be explained the used approach and assumptions and, how and why these sites have been chosen as study cases. It should be useful to explain the interest of choosing these sites and not others. It would be better to present each study case in a similar and concise presentation (vertical logs and values tables would be more understandable). Several figures are often too big or numerous (specially the pictures of instability evidence). Are they all useful ? the information from these pictures are not really used in the authors' text. A calculation of GSI index may be enough. - the part 4 may be improved by highlighting the authors' innovative work related to the Perrotti et al. (2018) paper and how much the model match with the study cases through a validation index.

More specific remarks or questions are in the paper text, through my personal notes. I hope that everything is readable

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-55/nhess-2019-55-RC2-supplement.pdf

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2019-55, 2019.