

## ***Interactive comment on “Comprehensive evaluation of high rocky slope safety through an integrated analytic hierarchy process and extension matter model” by H. Z. Su et al.***

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This manuscript studies some key problems and presents a case analysis of slope safety evaluation by some mathematical methods combined. The manuscript proposes an approach of comprehensive evaluation for slope safety. The proposed method consists of a systematic integration of several techniques, such as analytic hierarchy process, extension matter element and entropy. The proposed method has a high potential for other similar applications. Overall, I recommend the publication of this paper, after the suggested improvements properly addressed. Response: Thank you very much for the interests and time given to review this paper. We really appreciate your evaluation and approval for our manuscript. Below you will find our point-by-point responses to

C1

the comments.

<1>P7: In Equations (1) and (2), it will be more clear for the readers that one index is illustrated for ‘the index values with the larger the better tendency’ and ‘the smaller the better index value under different levels’, for instance, ‘the index values with the larger the better tendency, such as : :’ and ‘the smaller the better index value under different levels, for example: : :’. Response: Thank you very much for pointing it out. We have revised these expressions to be clearer for the readers. The revised sentences are listed as follows. ‘the index values with the larger the better tendency, such as cohesion force, ’ and ‘the smaller the better index value under different levels, for example, slope height, ’

<2>P14: Check Equations(23)~(24). Response: Thank you very much for your suggestion. We have checked the Equations (23) - (24) in Microsoft Word and PDF. There is no problem in Microsoft Word. There might be some mistakes during conversion from Microsoft Word to PDF. We have produced a new PDF version which is no problem for the Equations (23) - (24).

<3>P18: In Section ‘5.2 Final safety evaluation’, ‘The safety state of grade slope is  $\hat{\alpha}$ , which is fully consistent with the present situation that the high rocky slope...’. However, the present situation of the high rocky slope is vague, which is advised to be supplied. Response: Thank you very much for pointing it out and we agree with your precious comments. More details have been added to better embody the present situation of the high rocky slope to be clearer for the readers in Revised manuscript. The larger cumulative deformation velocity could reach to 3.5mm/d. At present, the maximum cumulative displacement amount is about 1500mm for one year. Therefore, the present rocky slope is unstable and its safety needs to be analyzed urgently by integrating multiple methods. Therefore, our conclusion is that the safety state calculated is fully consistent with the present situation that the high rocky slope. The whole process is clear, reasonable and complete.

C2

<4>The paper described 'An integrated Analytic Hierarchy Process-Matter Element Analysis-Entropy Weight method for solving multiple criteria decision making problem has been proposed: : :', while the title only covered analytic hierarchy process and extension matter model. Response: Your suggestions are appreciative. The authors have revised the title and the new one is more generalized, which is 'An approach using multi-factor combination to evaluate high rocky slope safety'.

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2015-336/nhess-2015-336-AC2-supplement.pdf>

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