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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Roadway backfill method to prevent geo-hazards induced by room and pillar mining: a case study in Changxing coal mine, China" *by* J. Zhang et al.

Anonymous Referee #2

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GENERAL COMMENTS: The manuscript is potentially interesting, but the overall quality is not acceptable in the present version. The authors need to be more rigorous and the manuscript needs to be strengthened in several aspects.

SPECIFIC COMMENTS: 1. Sections 2 needs of a schematic geological section in order to clarify the geological description, which is at present rough and too general.

2. Section 3.2 and 3.3: what kind of laboratory test has been carried out? The text does not clarify in the current version. What is the SANS material testing? Is a triaxial test apparatus? What are the boundary conditions and the loading conditions applied? The authors are invited to provide more details on this part of the manuscript, as well as to describe better Figure 3. Why do the authors show only the initial part of the

curves and not all the curves? Line 84: What is Scheme 2? This is not clear. The authors are invited to be more rigorous in the description and the comments of the test results.

3. Section 4 is not so important in the scheme of the overall manuscript. Probably, it can be shortened to a couple of sentences.

4. Section 5.1.1., lines 103 and 104: loading and boundary conditions are not clear. The authors should describe more accurately the simulation domain and boundary conditions applied. Moreover, the sizes of the numerical domain seem too limited with respect to the influence area and the problem to be investigated: risk of boundary effects in the numerical results is really high.

5. Section 5.2., line 124: what is the stress concentration factor? Please define it, before using in the text.

6. All the descriptions of the numerical results provided in sections from 5.2. to 5.3.2. are unclear. The authors are invited to clarify this part of the text by structuring the sentences in a better way and providing more details. Some comments provided by the authors are not justified and need to be explained with more details.

7. The maximum values of roof subsidence in Figure 8 do not correspond to the values provided in lines 136-137. The authors are invited to check this lack of correspondence and correct the values in the text.

8. Plots in Figure 8b (roadway width = 5 m) and 8c (roadway width = 7 m) are very similar. What is the reason for the very limited difference observed? The authors are invited to provide an explanation.

9. The definition of safety coefficient of a pillar provided in lines 159-160 is wrong: the right definition is the inverse of the ratio indicated, since the safety factor is equal to the compressive strength divided by the average compressive stress (ïAşc/ïAşp) and is general indicated with F or SF, rather than k.

10. Figure 10 is very unclear and too small. The authors need to enlarge it and provide more details. The figure needs a graphic scale. What are “shear-n” and “shear-p” in the legend? The comments provided in lines 172 – 174 are not recoverable from Figure 10.

11. Line 181: What is the “quadratic stabilization”? The authors are asked to provide a definition.

12. The authors do not clarify where all the indications provided in section 7.2. derive from. They are strongly encouraged to be more rigorous in this section and clarify from what result of their analysis they have derived these indications for the optimization of the excavation and filling sequence.

13. In section 7.3. the authors need to provide a curve showing measured settlements against time and not only the value measured at a certain time. This is very important to understand if the subsidence is completed or not.

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