

## ***Interactive comment on “An explanation of large-scale coal and gas outbursts in underground coal mines: the effect of low-permeability zones on abnormally abundant gas” by F. H. An and Y. P. Cheng***

**Anonymous Referee #2**

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The paper is well written and in rather clear way describes the analysis of the effect of low-permeability zones on abnormally abundant gas. The structure of the article is fine. Firstly the general conditions of coal and gas outbursts process are presented and presence of coal gas in geological structures is discussed. Then the chosen modeling parameters and obtain results are described, firstly for preservation conditions of abundant gas and annular zone of low permeability and secondly for effect of low-permeability zone on the likelihood of outburst. Presented results lead to clear conclusions. However, in my opinion, the description of the results should be fulfill by the

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specific values from the graphs used in figures 4, 5, 7, 8, 9. The results are simplified to sentences like: “. . . we found that the gas lost through the coal seam is clearly reduced by the low-permeability zone” or “The concentration of coal gas outside the zone is less than that of a normal coal seam”. Section 3.2 and 4.2 should be fulfilled by detail characteristic of the results, justified by the values of gas pressure in terms of position obtain for the graphs in figures 4, 5, 7. Maybe useful would be a table with chosen values. Specific comments: -section 3.2: Authors use different percent of the permeability of a normal coal seam. What is a value of permeability of normal coal seam? -figure 1. In the description of the figure the letters a-d should be described. Also there is no legend. -figure 2. In my opinion instead of indicating lines on the figure, there should be a legend. -figure 3. There should be a mark for 100 and 300 m as this are the numbers used for the model. -figure 4. In the description of the figure the position of each zone should be indicated (100, 300m). Also it would be useful to place vertical lines for different zones in the graph. -figure 5. The description should be “Gas distribution with various lengths of the low-permeability zone with permeability 0.1% of the normal coal seam permeability”. -figure 6. There is no legend. -figure 7. The vertical lines for different zones would be useful (100, 120m).

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