

Author's response to the referees

1. Author's response to referee #1

(1) Comments from referee:

In this study, the precursory of rock fracture after special treatment is studied in laboratory, and compared with the actual scene, which has certain enlightenment significance for earthquake monitoring. The method of this study is reasonable and the conclusion seems reliable. There is only one suggestion: in the introduction and abstract, there is a lack of induction and generalization of the existing problems, which leads to the work of this paper. Due to the lack of such a summary, the two parts of the article seem to lack logic. Minor repairs are recommended.

(2) Author's response:

We would like to thank you for your positive comments, as well as the suggestions to improve the manuscript. Our starting point is to try to make a different type of analysis to link the laboratory observations with natural seismicity by comparing their similar characteristics. In the abstract, we emphasize the research contents and results of this paper. The induction and generalization of the existing problems, which leads us to do the work is explained in the introduction part. Firstly, we introduce that laboratory rock experiments are an effective method to study the properties of rocks and faults while directly measure these properties is extremely difficult. Secondly, we attempt to establish the relationship between laboratory observations and naturally seismicity, which is the existing and unsolved problem in this research field, by comparing the similar characteristics of them. Thirdly, we detailedly describe the theoretical basis, steps of our work and its implication for earthquake monitoring. We follow this logic, which we think is more reasonable and fluent.

(3) Author's changes in manuscript:

We have not revised our manuscript based on these comments because our aim is clear and the context what we write is logical.

2. Author's response to referee #2

We divided the comments of referee #2 into four parts because the number of comments is large and the context of them is detailed.

First part:

(1) Comments from referee:

The investigation carried out by the authors is interesting in its attempt to identify shared features in laboratory and real-world seismicity. There are some minor but recurrent issues in grammar/vocabulary throughout the article that I believe need to be addressed. Presentation of some figures could be improved (some have unnecessary empty space and/or labels may be hard to read if printed).

(2) Author's response:

We would like to thank you for your positive comments, as well as the suggestions to improve the manuscript. We have checked the whole manuscript and revised the manuscript according to the referee (the new manuscript will be uploaded soon after contacting with the editor). The specific comments of the referee and our reply are as follows.

(3) Author's changes in manuscript:

We have revised some minor issues in our manuscript including expressions and figures, especially Figure 5 in which the labels is misaligned that due to the format convert of Word to PDF. We revised 'which' to 'that' in line 93, and revised 'step' to steps in line 135. We added a space between number and unit, such as in line 151, 159 and so on. We also added a space between degree and direction in line 198, 199 and so on. Moreover, we changed some words and sentences in order to express more accurately, such as words in line 221, 222 and sentences in line 239. All of the revisions are highlighted in the new manuscript.

Second part:

(1) Comments from referee:

In sec 2.4 the authors choose magnitudes of 2.5 and above for the catalogue, but it is not clear why this particular choice was made and how this pertains to the completeness of the catalog in space and time, i.e., is the chosen SAF catalog complete above this magnitude? (in other words, what is the magnitude of completeness for the chosen catalog and does changing these minimum magnitudes change the conclusions?)

(2) Author's response:

We choose magnitude of 2.5 and above for the catalogue because the chosen SAF catalog in one seismic cycle (1983-2004) above this magnitude is complete (Figure S1 in supplementary). We will add this statement in our manuscript due to the lack of clarification in the present manuscript. We analyze the catalogue completeness of magnitude of 2.5 and above, which shows slight variations with time divided in our research and has less influence on our conclusion.

(3) Author's changes in manuscript:

We added the statement in our new manuscript in line 212–214 and analyzed the completeness of the catalog in Figure S1 in supplementary.

Third part:

(1) Comments from referee:

Are there variations in time for this completeness specially after the larger events? Since the authors are speaking of links between experiment and 'natural' seismicity, it could be good to perhaps highlight/discuss the issues particular to each of the cases and where significant differences may lie between the two.

(2) Author's response:

We have not considered the variation in time for this completeness specially after the larger events yet, because the time we choose in this study is one seismic cycle that we think there is only one large event.

(3) Author's changes in manuscript:

We have not added these discussions in our new manuscript because we choose only one seismic cycle. The variations in time for this completeness after the larger events may be included in next seismic cycle, which may change slightly because the seismic cycle in this region is relatively stable.

Four part:

(1) Comments from referee:

For example; how would various types of incompletenesses (short-term aftershock incompleteness, catalog incompleteness etc.) affect their statements/conclusions? Within the context of the experimental setup, how are these incompletenesses accounted for? Given the brevity of the conclusions perhaps that section could be expanded to include some of these points along with a more elaborate synthesis of the statements in Sec.4.2. In Sec. 5, it could also be instructive and clearer to understand the overall message of the study by elaborating under which parameters/conditions the "... attempt to link the experiment with the nature" is made.

(2) Author's response:

The questions the referee proposed are very interesting and beneficial to our research in the future. In this study, we set different thresholds to capture the large deformation sampling points of different samples, corresponding to the magnitude of 2.5 and above for the catalogue we choose. How incompleteness corresponds to the experimental results in this study is not easy to analyzed, which is also not our target. We aim to link the experimental results with natural seismicity and hope to apply this foundation on earthquake monitoring.

(3) Author's changes in manuscript:

We have not changed the context about this in our new manuscript because the incompleteness may do not exist in our research especially when we choose the magnitude of 2.5 and above for the catalogue. These questions are exactly what we are going to do next. However, the thresholds we set for different samples corresponds to magnitude of 2.5. In this case, we get the conclusions.