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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Time difference of arrival estimation of microseismic signals based on alpha-stable distribution" *by* Rui-Sheng Jia et al.

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Referee #1

Q1. A review of paper for grammatical errors and typos is suggested. Some missing punctuation in some places - Some clarity is required with regards to certain statements: e.g "The pulse characteristics of the microseismic signal is outstanding" seems vague. General contains a number of vague sentences

A1: We are very sorry for our poor english writing. We have made correction according to the Reviewer's comments, see P1L11.

Q2. The examples provided haven't fully demonstrated how this is better than the generalized cross-correlation.

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A2: It's really true as reviewer suggested that our metod is better than the generalized cross-correlation, we have added some experiments to verify the method by changing the value of GSNR, and we have added PHAT-GCC method to be compared. See P18.

Q3. Paper isn't suitable for a general audience, provide better context as to why this is important/useful. Also provide some background to better understand concepts presented.

A3: As reviewer suggested that paper isn't suitable for general audience,We have added a reference to introduced the background in paper. See P1L25.

Q4. Figures are too small, try increasing font sizes on captions and figure size.

A4: It's really true as reviewer suggested that figures are too small, We have increased fontsize on captions and figure size. See P15-P19.

Referee #2

Q1. The number of Eq. (7) is not aligned.

A1: We have made correction according to the Reviewer's comments. For the corretion detail, see P4L93.

Q2. Your innovation is not highlighted in the theoretical parts.

A2: We have re-written this part according to the Reviewer's suggestion. For the modified detail, see P6 L165-P7L169

Q3. In step2 of 3.3, 0.95 should be introduced.

A3: 0.95 is an empirical value, the purpose of which is to make the value of A, B satisfied , Considering the Reviewer's suggestion, we have introduced 0.95 in P9L220-221.

Q4. In experiment 1, the definition and formulas of GSNR should be introduced.

A4: We have introduced the definition and formulas of GSNR in P9L228-229.

Q5. In Fig3(a), the energy of P wave is larger than the energy of S wave. But in most field microseismic data, the energy of S wave is larger than the energy of P wave, so I think your measured microseismic signal is not representative.

A5: It is really true as Reviewer suggested that our measured microseismic signal is not representative, We have chosed a typical microseismic signal and redrew Fig. 3. For more detail , see Fig. 3 in P17.

Q6. In Fig. 6, your method is just compared with one conventional method. I think this is not enough, your method should be compared with two conventional methods at least so that the advantages of your method are more persuasive.

A6: Considering the Reviewer's suggestion, we have added PHAT-GCC method to be compared. See P18.

Q7. In experimental part, your method is not tested by field microseismic data, you should add actual experiment in this paper.

A7: As reviewer suggested that our method is not tested by field microseimic data in expriment part, we have added test by field microseismic data in section 5: Case Study. See P10.

Q8. Three components of microseismic signals should be added in your paper.

A8: We have added three component of microseismic siginals in the paper. See P2L52-53.

Q9. In experimental part, the value of the GSNR is only one , I think you should change the value of GSNR and do more experiments. This can verify whether your method will be affected by the energy of the noises.

A9: As reviewer suggested that we should change the value of GSNR and do more experiments, we have added some experiments to verify the method. See P18.

We tried our best to improve the manuscript and made some changes in the

manuscript. These changes will not influence the content and framework of the paper. And here we did not list the changes but marked in red in revised paper.

We appreciate for Reviewers' warm work earnestly, and hope that the correction will meet with approval. Once again, thank you very much for your comments and suggestions.

Please also note the supplement to this comment:
https://www.nonlin-processes-geophys-discuss.net/npg-2017-49/npg-2017-49-AC1-supplement.pdf

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Interactive comment on Nonlin. Processes Geophys. Discuss., https://doi.org/10.5194/npg-2017-49, 2017.

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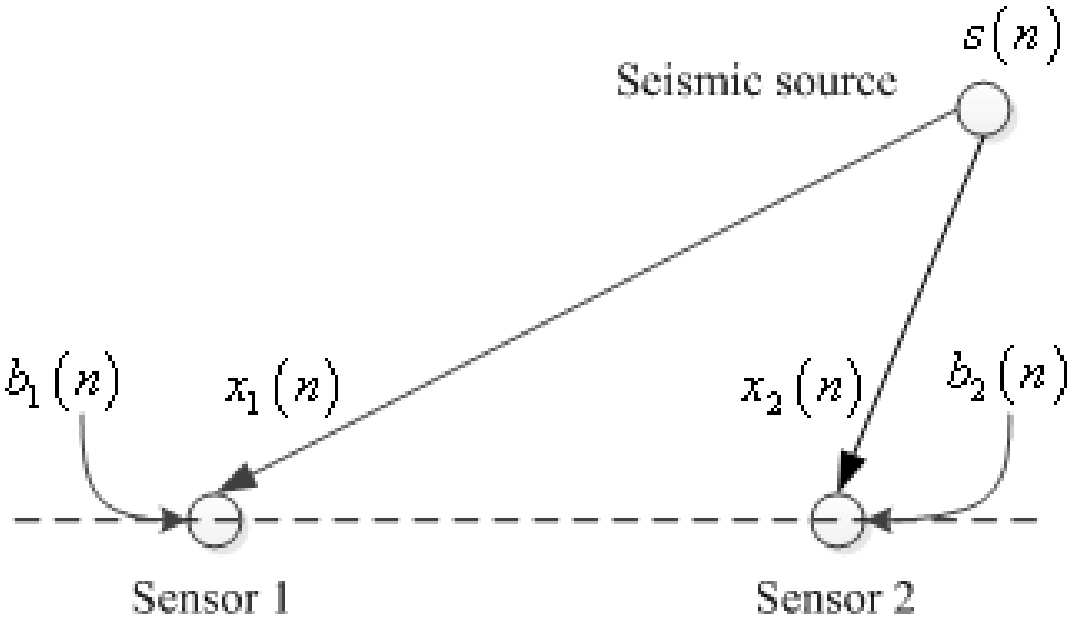

Fig. 1.

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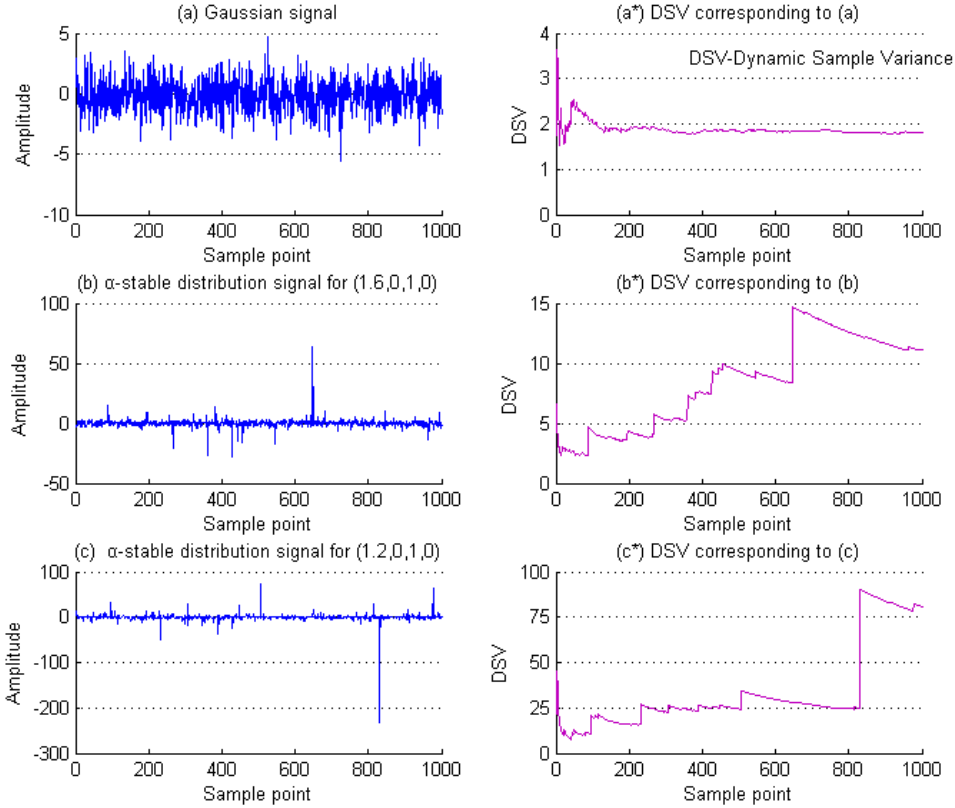

Fig. 2.

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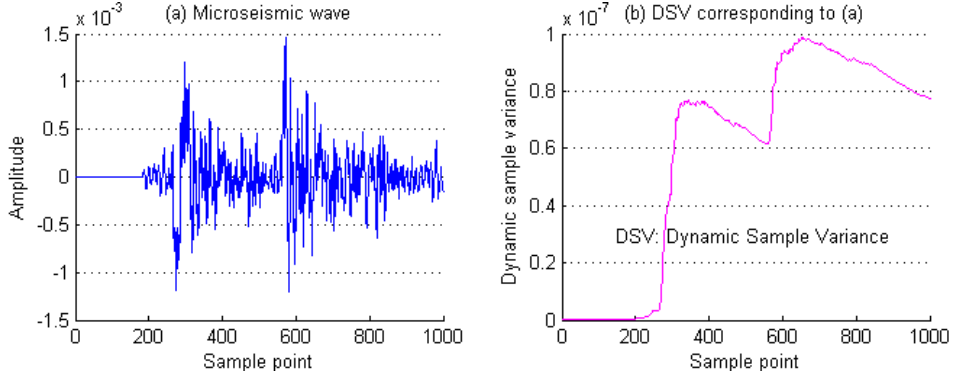

Fig. 3.

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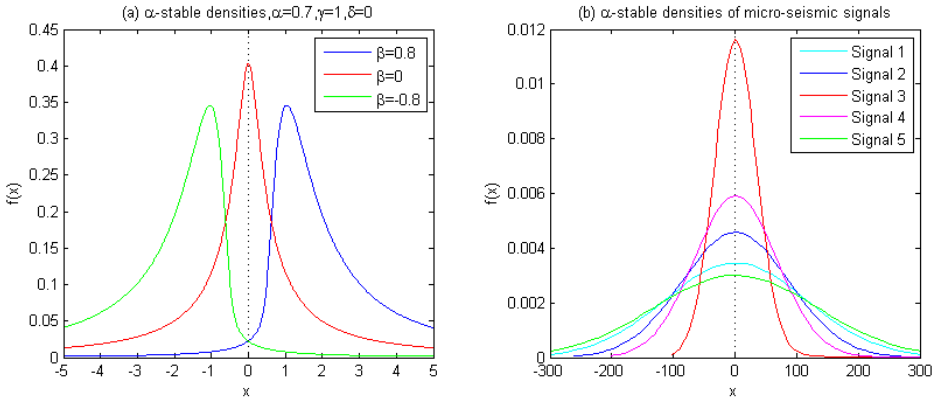

Fig. 4.

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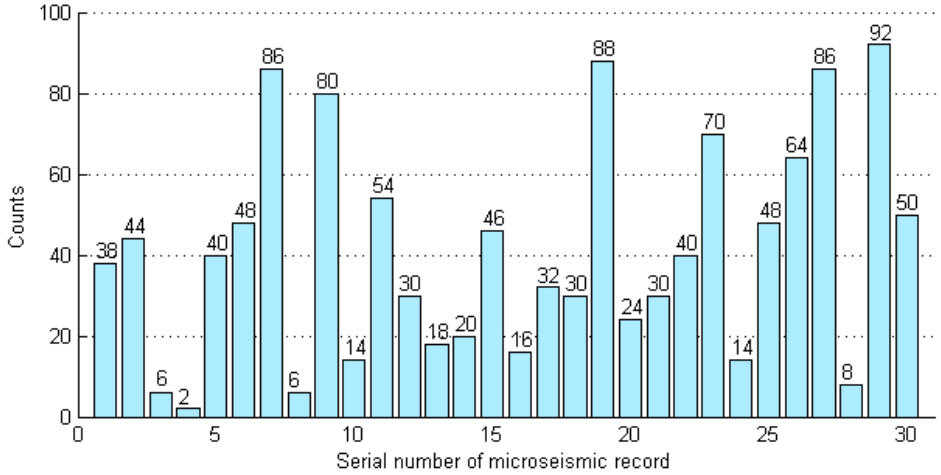

Fig. 5.

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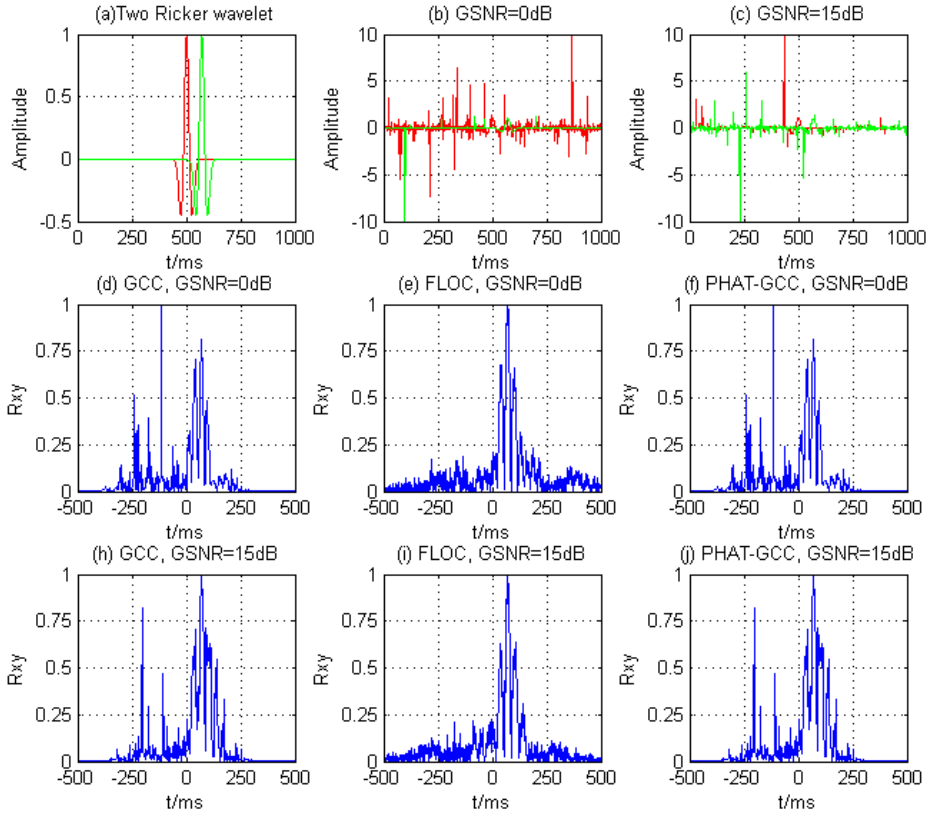

Fig. 6.

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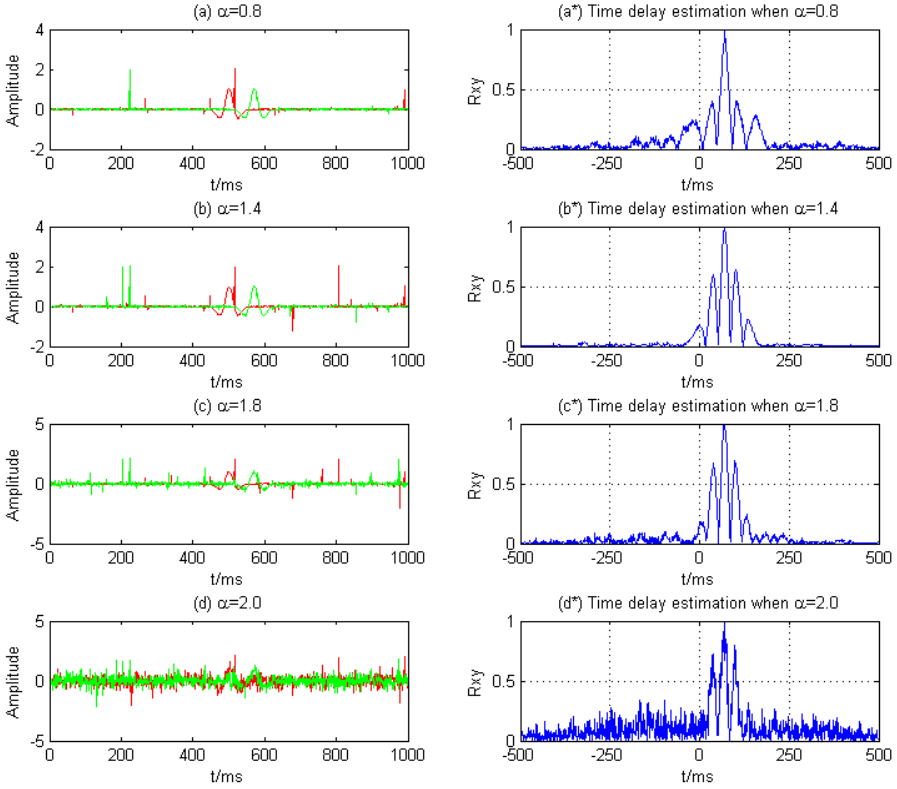

Fig. 7.

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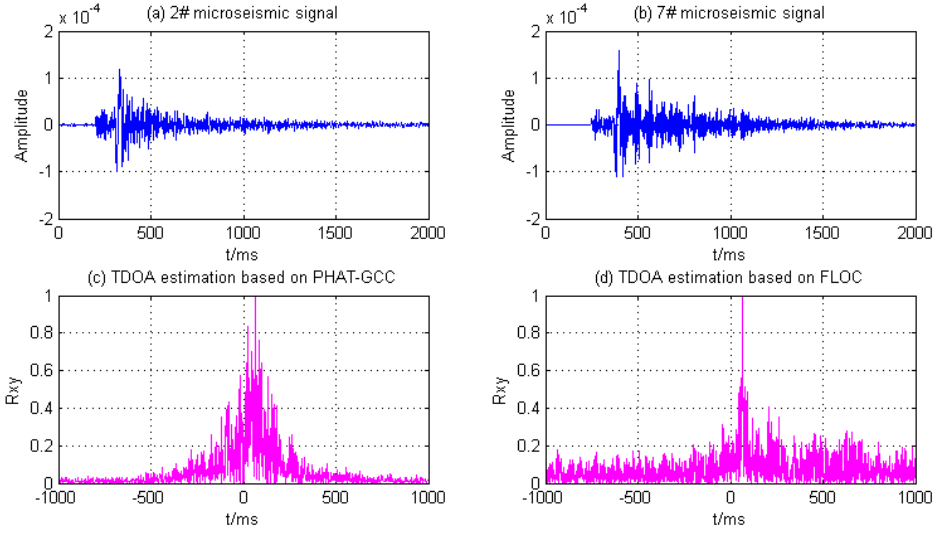

Fig. 8.

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