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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Seismic section image detail enhancement method based on wavelet transform" *by* Xiang-Yu Jia and Chang-Lei DongYe

Anonymous Referee #2

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Dear Editor and dear authors, First of all I apologize for the delay in finalizing the review. GENERAL COMMENTS: The manuscript proposes a new method for the enhancement of some important details for seismic section images. In the introduction, a complete overview of the state of the art of the existing methodologies for the image processing is provided, highlighting the limits of the different categories of methods. Then, the new method is described, and an its application to two different examples of seismic sections is shown. Through them, the improvement in the quality of seismic sections is shown with respect to the original image and the ones provided by other methods, mainly in the second application. The presentation of the manuscript is clear and coincise; the text, in the most part, is fluent and precise; the figures are of good quality. My only substantial request to the authors is to provide further details about

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how these improvements in the image processing can help people to read seismic sections. In particular, referred to the examples provided in the manuscript, the better resolution achieved with your method is able, for example, to highlight some useful details, for geological/exploration purposes, that were completely hidden in the original image or in the ones retrieved by other techniques? On these grounds, my suggestion is to accept the manuscript after a very minor revision. TECHNICAL COMMENTS: Page 1, line 22: “It is of great significance” ... Can you specify with more detail what is of great significance? Page 1,line 30: “etc;” change into “etc.” Page 1, line 32; “The” change into “the”. Concerning this, there are many similar typos along the manuscript, and also in the abstract, i.e. capital letter after semicolomns. Please fix it. Page 2,line 2: “Then using a high-pass ...” Reformulate into “Then a high pass filter in the Fourier transform domain is used” Page 2, line 4: Can you better specify what do you mean with high and dark areas? Page 2, lines 7-10: “Such methods perform ...” Please reformulate. Page 2, line 12: Can you say what do circular effects on the edge consist in? Page 2, line 25: “The experimental ...” I suggest to move this sentence to the conclusions or to directly remove it. Page 2, line 29: “In this paper, the ...” change into “The wavelet ...” removing “In this paper”. Page 3, Step 5: Could you please insert the symbol Y’ in the figure 1, as described in the step 5? Page 3, Fig.1 Please indicate the “contrast adaptive enhancement” described in the step 6 in figure 1. Page 4, line 13: what is q? Please introduce it here. Page 4 , line 19-20: “Assuming an image block ...”. Can you reformulate in a simpler way this sentence? It is too rich in asides. Page 7, line 1 and following ones: I suggest to write the different passages as a list; Page 7, line 6-7: “Performing ...”I suggest to reformulate this sentence. Page 7, line 8: “Detail enhanced ....” Do you mean “Detail enhancement?”. Please reformulate the sentence Page 7, line 11: Fig 7 (c) $\longrightarrow$ May be Fig. 7(d)? General comment about the presentation of the figures 5 and 6: I suggest to rearrange them so that the reader could directly see the effect of the processing on the different components of the image. For example, you show in figure 5a the low frequency image component; in figure 6a the results of the bilateral texture filtering on figure 5a. In my opinion it could be

more useful to show the images before and after the processing in a single figure. The same suggestion is for the other components of the image (cH, cV and cD). Page 9, line 8 and following ones: In the description of the final images, retrieved with different algorithms, it could be very useful to refer to specific points that you could mark on the images: For example, you write : “The large-area oscillation period texture in the seismic section image cannot be well processed and a false edge is generated during the processing”. In my opinion, these features should be marked on the images, so that the reader could better understand the improvements in the image resolution retrieved by your algorithm. Page 9, line 20 and 21: can you explain the differences between point information and linear texture information? Page 10, table 1: Could you please better describe this table, reminding the meaning of k ? Page 11, line 9; “better real-time performance”. May be I misunderstood, but in the previous page you wrote “The running time of the proposed algorithm is several times slower than that of the bilateral filtering”

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