

Interactive comment on “Crust and upper mantle structures of the Makran subduction zone in south-east Iran by seismic ambient noise tomography” by M. Abdetedal et al.

Anonymous Referee #2

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This paper treats crust and upper mantle structures of the Makran subduction zone in south-east Iran by seismic ambient noise tomography. Probably, I think that the results of this paper contain important findings on tectonics of the studied area which many readers do not know well. However, I could not find out what are new findings derived from this study. I recommend that the authors select and focus the important objectives of this paper and describe clearly what are important results.

I think that this paper have many points which should be carefully checked and reconsidered. Below, I give my comments.

1. Figure 1 is hard to understand the geology and tectonics of the study area. For

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example, what are “WM” and “EM”? I recommend replacing the topographic map in Fig.1(a) with the geological map in which tectonic blocks discussed in this paper are clearly shown.

2. In lines 6-9 in Page 4, the authors describe the change in seismic activity across the Sistan Suture Zone. In Fig.1 (b), however, we see no significant difference in seismicity. The authors should designate an area discussed in this part of the text using, for example, arrows and add more clear explanation.

3. In Page 5, the authors described that they used ambient noise tomography. Why is this method superior to the other methods including seismic tomography used in the previous studies. The authors also should describe more clearly their own aims in this paper from geological/tectonic view points on the studied area.

4. Some technical descriptions in “Introduction” (lines 20-29 in Page 5) should be moved to Sec. 2 or Sec. 3.

5. In page 11, the authors adopted the results from the first iteration. If this is the best, the authors should provide an example in which the solutions at the 1st iteration are the best as compared with those from other (later) iteration steps.

6. Tomographic results are difficult to understand. The authors should clearly indicate discussed areas/patterns by arrows or appropriate symbols.

7. In lines 19-23, page 13, the authors describe a transition from low to high velocity. In Fig.8, however, a boundary between the low velocity and high velocity blocks seems to extend in west-east direction, and does not coincide with the Sistan Suture Zone. So I say again that the authors show more clearly areas they intend to explain. Where is the “transition”? From the present explanation, I do not understand that this suture zone is a segment boundary.

8. Letters in Fig.9 are hardly recognized, which also makes difficult for readers to understand the results. Some improvement is required.

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9. In Page 14-15, the authors discuss the comparison of seismic activity with their tomographic images. Why do not the authors plot earthquake locations on their tomography results in Figs. 8 and 9. It is really interesting and important for this paper.

10. The paper by Shad Manaman et al. (2011) was referred at line 15 in Page 14. But some explanation on this paper is given earlier part of the text (line 25 in Page 15). I think that such explanation should be given where this paper is firstly referred. For me, the method by Shad Manaman et al. (2011) is not understandable. What is the partitioned waveform inversion? The last two paragraphs in Page 15 seem to be redundant.

11. Earthquake activity related with the Sistan Suture Zone is unclear for me although some events are distributed along the fault. I recommend the more explanation in the text and the improvement of Fig. 1b or the other related figures.

12. "SSZ" described at line 12 in page 16 is not found in Fig. 11.

13. In my understanding, the authors discuss discrepancy between their result and that by Shad Manaman et al. (2011) at the eastern edge of the Straits of Hormuz. They attribute this discrepancy to the structural complexity. This explanation is too simple. They should also consider the difference in methodology and data.

14. I think that the authors discuss a lot of things in Sec. 6, but they seem to be diverse. What is the most important finding in this paper. Selecting their finding, the authors can construct a schematic structure model in their study area. This is very important in understanding what the authors intend to explain.

Interactive comment on Solid Earth Discuss., 6, 1, 2014.