Nonlinear Processes
in Geophysics

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Discussions

Interactive comment on "Site effect classification based on microtremor data analysis using concentration–area fractal model" *by* A. Adib et al.

Anonymous Referee #1

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The manuscript entitled "Site effect classification based on microtremor data analysis using Concentration-area fractal model" proposes a method to classify site effect data using microtremor technique in central Iran.

General comments:

The novelty of this article is to propose to apply the well known Concentration Area multifractal classification model (Cheng et al., 1994), that was designed for extreme distribution detection on geochemical dataset, on the dataset on microtremor.

The Concentration Area classification model (C-A) is not fractal but multifractal (see Cheng et al., 1994). The text is often using fractal (supposed to be monofractal) and multifractal. Please clarify the text.

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My main concern is about the use of C-A classification for more than two classes. The basic idea of C-A is to simplify asymptotically, the multifractal statistics in two scale domains: close to alpha_min and close to alpha_max. In both cases, the area statistics follow a scaling power law with different slope. This was done originally in order to separate usual variability and extreme fluctuation. The C-A model in not adapted for more than two classes.

Cheng et al., 1994 discuss another type of model: the bifractal, which consist to claim that the geophysical data follow two monofractal scaling laws separated by a threshold scale. Both asymptotic multifractal and bifractal can create apparent break in the power law slopes.

I suggest the author to clarify their interpretation: are the data monofractal on different separated scale domains? Are the data multifractal? In order to answer this question, a multifractal analysis is required. For instance the trace moment analysis will be helpful: http://www.physics.mcgill.ca/~gang/software/index.html

Another comment is about the lack of justification of the classification on the frequency. Why the authors are choosing frequency (table 6) instead of amplification or k-g? Please justify this choice.

Minor comments:

All figures are with poor quality, please improve them.

Figure 2: "cultivated land" is not a geological unit but a vague pedological concept.

Figure 3: Both horizontal and vertical scales are missing

Figure 8 and figure 9: The comparison is hard between the two classification method. Please plot all the microtremor points for both figures. Please represent a classification map for figure 9, instead of an interpolated map.

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