



Interactive comment on “Spatial analysis of oil reservoirs using DFA of geophysical data” by R. A. Ribeiro et al.

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We thank the referee for the careful reading of the manuscript. Criticism is a key point to improve a scientific work.

The central topic of our paper is the search for spatial patterns using DFA of well data. We use spatial correlation analysis, k-means and Mantel-test in our methodology. In a previous paper (Ribeiro, 2010) we search for correlation among geophysical data, but not explore spatial analysis, which is the main topic of this work. In (Ribeiro, 2010) the correlation among geophysical data was not performed with Mantel test, neither it was in other works of the literature, so we also performed this test in our paper. The results concerning correlation among geophysical data agree in the most with previous works. For instance, sonic and density are correlated quantities. Perhaps, as pointed out by

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the reviewer, the correlation between porosity and resistivity is a statistical artefact, but I think that more research with different data sets will be necessary to have a clear understanding about this issue.

The paper is about the possibility of using DFA to create spatial patterns. As just one geophysical quantity, the sonic, appears to be a good candidate to generate spatial patterns our conclusion is not a clear yes, neither a no. We use a term that sounded, maybe, lyric or not scientific. We erased from the text the expression "yes without enthusiasm". Indeed, the sentences following this expression describes the results without any personal judgement. In this way we follow a language more adequate to a scientific publication.

There are some passages in the methodology concerning DFA technique that are very similar to previous sentences used in a reference of ours (Ribeiro 2010). Indeed, the sentences are in the methodology and refer to a standard presentation of a mathematical tool, the definition of the fluctuation function used in the construction of the DFA exponent. Anyway, we have improved the methodology in several points and as a consequence it is quite diverse from the cited work.

About the minor points

1- We changed the place where we defined $\Delta \alpha$ to follow a standard logic structure.

2- We performed a grammatical revision of the text, several sentences have been changed to improve the style and the fluency of the manuscript.

PS: Following the policy of the journal, the update of the manuscript will be done after the end of the discussion process.

Interactive comment on Nonlin. Processes Geophys. Discuss., 1, 877, 2014.

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