Solid Earth

Discussions

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# *Interactive comment on* "Inversion tectonics: a brief petroleum industry perspective" *by* Gábor Tari et al.

**Gábor Tari et al.**

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Response to the comments made by Michael Gardosh (Referee) We really appreciate the positive and constructive comments made. We will incorporate all the comments into the final version. Here are the specific responses to the comments. General comments: 1. We agree, this is a highly important subject for the petroleum industry. 2. We will add more on the topic of source rocks and charge as to the case studies. 3. We agree, extrapolation of the findings from one well-constrained inversion structure to another, less constrained one should be done carefully and indeed, it assumes a largely similar, if not identical, geological history. Specific comments: 1. Will be corrected. 2. Will be reworded accordingly. 3. Will be added. 4. The 8.5 TCF reserve number will be added quoting the referee. 5. Correct, we will have to make this clear, that "typical"

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refers to the classical case (ratio of syn-rift/post-rift fill more than 1) whereas our case studies are deliberately showing the underappreciated case (ratio of syn-rift/post-rift fill less than 1). 6. Correct, the end member cases will be described as such. To us these are a) source rocks in the extensional basin fill and b) regional source rocks in the post-rift but pre-inversion basin fill. 7. Will be redesigned accordingly. Comments on figures: Fig. 3. Correct and it will redesigned accordingly. Fig. 4. Will be done. Fig. 5. Will be done. Fig. 6. Will be done. Fig. 7. These geometries will be noted on the figures with additional text. Fig. 8. Will be corrected. Fig. 14. It is somewhat difficult as the full explanation of the calculations would require quite a bit of additional text. We will try to highlight the overall difference between these two approaches with reference to the original publications. We will also highlight the fact that in everyday practice these are difficult calculations as many of the parameters may not be determined precisely due to poor data. Therefore, we are planning to propose a less quantitative but perhaps more practical method to categorize the degree of inversion. For example, the ratio between the elevation of the highest point of the inverted sequence above the corresponding regional stratigraphic surface and the horizontal extent of the initial extensional basin in a dip direction, on top of the extensional sequence. These parameters are relatively easy to measure and do not require the full imaging of the master fault and the various offsets along it. The geometric ratio could be used as a semi-quantitative descriptor of the degree of inversion, i.e. the larger numbers would correspond to more "advanced" cases of inversion. Finally, we also appreciate the extra effort by the referee correcting some other mistakes we made in the original draft text/figures and forwarding the annotated version to us. We are very grateful for the additional work which went into that part of the reviewing process as well!

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