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Interactive comment on "Neotectonics of Brazzaville and Kinshasa: linking Congo Basin seismicity and in situ stress in the Inkisi Group" *by* Hardy M. D. Nkodia et al.

Anonymous Referee #2

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Overall comment: nice study, but it could be presented better. It would be nice to improve figures and descriptions in the text as suggested. The discussion could include more related work, and I would be careful not to overinterpret. What I don't understand is why you need transform faults that are potentially inactive or only have vertical motion on them to transfer stresses into the mainland?

Lines 53 to 54, please rewrite "delimiting the horsts and grabens of basemement rocks". What do you mean? Horst and graben structures in basement rocks maybe? Line 55 how does an EW compression fit with a horst and graben structure? What is the orientation of the horst and graben structure?

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How does the last sentence in 59 to 60 fit with the rest? What tectonic phases? Please make this more clear, I think this introduction needs to be a bit rephrased and structured better, it is too vague in the current form.

Figure one the data from the world stress map, is this horizontal compressive stress? If yes than it is not necessarily related to a thrust-fault stress regime (also typo in the map).

The geological events are strange. In the map you don't have Archaen, yet in the events you talk about the Congo Craton that should be Archaen. Instead you present different units throughout the Proterozoic. In the geological events you only talk about Pan-African. Where is the rest? I think this geological history needs to be a bit better explained in a more consistent way. If you define the Congo Craton as also containing all the Proterozoic mobile belts then you need to say this, and also mention these events.

87 I would leave out the lithospheric dynamics. Surely they can be reactivated, but why lithospheric dynamics?

91 made up of

90 to 100 this description of units is in contrast to your descriptions of geological events before and does not really include ages. For a person not familiar with the area this is not possible to understand. Sorry, but I think you might have to rewrite this geological introduction a bit.

Figure 2 is a bit better for understanding.

The method description is fine.

144 if you talk about fault orientation I assume you mean strike? Maybe say NW-SE striking? And why are both, NW-SE striking joints and sinistral strike slip fault in the same set? What are the numbers in the figure, strike or dip directions? They are not striking/trending in the same direction in the figure, or are these different ages/sets?

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Discussion paper

Please make this more clear. You may want to add directions to the figures, like E W or North or view to north or view from the top... That would help. Same for figure 5 please.

165 what is a “linear break”?

ok in 180 you explain the relation of the phase better. I think you need to work a bit on the field characterization, to make it clearer. The figures are ok but need labeling and the text needs to be a bit clearer.

186 or so “strike slip regime whose the tensor indicates” ?? Is there something missing? I don’t understand the sentence. Maybe its just a word missing.

Figure 10 you talk about focal mechanisms for earthquakes. I don’t think you are showing them, do you have them? Or did I miss this? Also the earthquakes are not on the Fracture zones. In addition outside of the mid ocean ridges the fracture zones do not have sinistral nor dextral offset any more normally. They typically show some vertical motion.

Figure 11 I find hard to read. Why do you show a graph of azimuth and no thte actual focal mechanisms as beachballs, that is where your data comes from, right?

179 are you not using the same method for the field stress inversion and the WinTensor program? So they should fit anyhow or does the win tensor program give you more information?

332 I don’t agree with this statement. The earthquakes are in between the two zones. Why do you need a transform fault that does not move any more to transfer stresses? I find the whole paragraph a bit vague. I would think that the argument that old lithosphere builds up the compressive stresses may be realistic as an argument. But is this linked to the transform faults? Or do the transform faults just form boundaries of a block that is stressed? Again having the data of Heidbach on a map would help a lot. Plus if it is the old lithosphere that produces the stress, is that really “ridge push”?

I think the discussion of what causes the compressive stress and how it may vary along the African margin could be discussed in much greater detail. I would also be careful with sentences like “They have been produced by the ridge push. . .” , yes maybe but you don’t have 100 percent evidence.

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