

## ***Interactive comment on “Jurassic–cretaceous deformational phases in the Paraná intracratonic basin, southern Brazil” by A. J. Strieder et al.***

**Anonymous Referee #1**

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Comments on the manuscript:

“Jurassic–cretaceous deformational phases in the Paraná intracratonic basin, southern Brazil”

By A.J. Strieder et al.

Submitted to Solid Earth (sed-7-1263-2015)

This manuscript deals with structural analysis survey conducted within the Serra Geral and the Botucatu formations with the aim to evaluate the paleostress field during the Jurassic to Cretaceous period in the Paraná Basin. The Authors provide (i) meso-scale examples of the observed deformation structures, (ii) a basic regional-scale geological overview, and (iii) analysis of the brittle structures focused mainly on stress inversion

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techniques applied to fault-slip data. Large part of the manuscript is centred on the paleostress inversion. In my opinion, the present form of the manuscript needs for extensive revisions before to be accepted for publication on Solid Earth.

I added my major and minor comments/suggestions in the attached file, and I resume here:

- The Introduction does not explain the real geological problem. The present Introduction reports the list of the previous works. It is not clear how the work by Strieder and co-authors should represent a progress in the knowledge of the tectonic evolution of the Paraná Basin. In general, the Introduction should be rewritten and re-organised;
- A “Geological Setting” completely lacks. Although some information have been provided within the Introduction, the Authors are forced to provide the geological framework for the Paraná Basin. In particular, the main Mesozoic tectonic stages are welcomed (deformational phases listed in Table 1 are not enough, and they have to be detailed within the text);
- The methodology paragraph (paragraph #2) is not well organised. It mixes methods and a preliminary report of results. It is not clear which was the rationale used by the Authors (why they focused on the Serra Geral Fm; which is the main goal of the structural analysis; ...). Some analytical parts of this paragraph can be moved in an Appendix;
- Data presentation is elusive. Deformation structures are not described in detail. The Authors mainly focused on the kinematic and geometric parameters of these structures, although some representations (the  $\pi$  diagram, the balanced cross-section) are questionable (see my comments in the attached file); - The discussion of the results is centred on the stress states of the deformation phases. Anyway, a tectonic scenario framing the deformational phases (D1 and D2) is essential to me for reinforcing the scientific message of this work. In particular, I suggest a tectonic scenario for illustrating the regional and meso-scale, major and minor structures that developed under the

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reconstructed constrictional deformation condition;

- The Conclusion is not at the point and does not explain the real novelty from this work;
- Some figures should be improved (see the attached file) (Fig. 18 is wrong, I suppose).

Please also note the supplement to this comment:

<http://www.solid-earth-discuss.net/7/C514/2015/sed-7-C514-2015-supplement.pdf>

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