The paper provides for the first time a quantitative approach for the oblique collisional tectonics in SW Iberia. The authors combine different structural models from the literature with published field data and propose an accumulated sinistral strike slip component of at least 1000 km between the Central Iberian Zone (Gondwana) and the South Portuguese Zone (Laurussia). The authors emphasize the uncertainties of the particular estimation, because robust displacement marker like piercing points are almost lacking.

The weakness of the proposed model lies in the uncertainties regarding the considered strain marker. The evaluation of the geometry of the finite strain ellipse in terms of the applied shear strain depends on the vorticity number of the particular ductile shear zones. In high strain zones, however, it is virtually impossible to estimate the proportion between pure and simple shear.

Nevertheless, this first proposition of accumulated strain in SW Iberia is worth to be published and may be serve as a basis for future discussion. However, the paper needs significant substantive changes as well as structural reorganization.

I am therefore recommending major revision and possible re-review.

Remarks

Structure of the paper

The paper is full of redundancies and jumps between the geological setting, detailed structural descriptions and used methods for the quantification. In all this descriptions the reader is lost in details and the roughly estimated left lateral displacements are hidden in the text. Even in the summary (6.1 “The big numbers of SW Iberia Variscan transpression”) there is a jump in time and regions and it looks like copy and paste from the previous paragraphs.

General geological descriptions like lithologies, tectonics and geochronology should be concentrated in a chapter “geological setting” followed by a concise summary of the applied methods.

The used constraints should be organized in a table (geological unit, age, kinematics, applied method, displacement)

Finally, redraw the Figure 14 using the time steps of Figure 4 (delete fig.4). Place the sketchy retro-deformed units in the different maps thereby creating “pseudo”-palinspastic sketches for the SW-Iberian Variscides.

Geological setting and existing models

Reading your paper it seems as if exclusively your group proposed sinistral strike slip for this part of the Variscides in contrast to the generally agreed large scale dextral strike slip (sensu Shelley and Bossière, 2000). This is definitely not the case and a concise and critical discussion of the different models is necessary. Because more than 50% of the cited references are at least 15 years old in the group exists definitely a profound knowledge regarding the classical Variscan literature.

For example, the classical model of the Ibero-Armorican Arc (Matte, 1986) considers significant sinistral transpression in SW-Iberia and explains the arcuate shape with west directed indentation of Central-Iberia. I can´t see any differences to your approach wondering why the Ibero-Armorican Arc model is completely ignored in the paper. Additionally there are some recent, but different explanations regarding the formation of the Ibero-Armorican Arc (Gutiérrez-Alonso et al., 2008;

Kroner and Romer, 2013). For the tectonics of the frontal part, i.e. the western edge of Iberia please include additionally (Martínez Catalán et al., 2009). Because these ideas are already published they should be part of the geological setting and not part of your conclusion.

The exotic character of the Pulo do Lobo complex and subduction of the Ossa Morena Zone beneath the South Portuguese Zone

In the qualitative reconstruction of Fig. 2, the Pulo do Lobo complex is interpreted as the outer shelf of the South Portuguese Zone, i.e. the upper plate. This view contrasts with the classical view of an accretionary wedge and is in conflict with detrital mica data precluding an initial proximity with the South Portuguese Zone (Braid et al., 2011). Because the Pulo do Lobo Complex is essential for your model you have to discuss this topic thoroughly.

Moreover, in the Late Devonian your reconstruction reveals a large distance between the Ossa Morena Zone and the South Portuguese Zone. How fits this result with your previous model (Fig. 2)?

4.1 Ductile shearing CIZ-OMZ

Age of ductile shearing: how correlates a cooling age of 370-360 Ma (Ar/Ar Hornblende) with 340 Ma (U/Pb on zircon)? A critical reappraisal of the published geochronological evidence is necessary.

"Nevertheless, the previous high pressure metamorphism would have occurred prior to Late Devonian time" What is the evidence for this statement (references, data)? And what is the relation to the orogenic wedge geometry

"Two simple shears during a subduction exhumation path": Do you have any evidence for prograde fabrics in the HP rocks?

4.2 Deformation inside the OMZ

"There is no transpressional model that fits the complex and heterogeneous evolution of the OMZ": What's about the tectonic model of the OMZ by Silva and Pereira (2004)?

5.1: see comment above (OMZ – Pulo do Lobo – SPZ)

5.2 Ductile shearing and large scale folding at the OMZ-SPZ boundary

Regarding the South Iberian Shear Zone are there some geochronological data?

Stereoplot of Fig. 11: what is the reason for the unusual scatter of the fold axes?

Figure 14: general comment see above.

Avalonian spur? Why is the SPZ considered as a spur? If there is 1000 km of frontal collision between Central-Iberia and Laurussia than the SPZ constitutes a lateral foreland in relation to the Gondwana – Laurussia collision. Would you call Pakistan an Asiatic spur in terms of the India-Asia collision?

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