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Solid Earth Discussions

Interactive comment on "The boundary between the eastern and western domains of the Pyrenean Orogen: a Cenozoic triple junction zone in Iberia?" *by* S. Tavani

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I have read with interest the paper "The boundary between the eastern and western domains of the Pyrenean Orogen: a Cenozoic triple junction zone in Iberia?" by S. Tavani. This paper provides a thorough reappraisal of the lateral culmination of the Pyrenees, reassessing the available information and integrating with new data collected.

Point 1

Reviewer: I find the paper of interest, in general, and the implications appealing. However, the latter are not well supported, and come suddenly in the discussion. While I suggest an overhaul to streamline the text -it is in part hard to follow- I would also

recommend explaining more in depth the plate kinematics implications, to increase the appeal of the paper. I agree that reconciling the geological data with the plate kinematics in this area is very difficult. Important to realise is that the problem is relative to the Iberian plate, first, in order to make progress. The Pyrenees, in facts, do not fit common plate tectonics paradigms in many ways: there is no clear subduction in tomography, almost margin-parallel convergent motions, no independent motions of the Iberian block and un-constrained pre-break up kinematics, defining its original position. For this reason the solution proposed has the potential to introduce a novelty, although needs to be reshaped to be more convincing. The plate kinematic problem can be addressed spanning across the many different published rotation set and reconstructions. Most of the time, the rotation poles are refined to fit the local model, although they introduce inconsistencies in neighbouring domains, not always addressed (see Capitanio and Goes, 2006, Geophys. J. Int., v. 165, p. 804-816).

Response: I agree. The introduction will be rewritten to present the different plate reconstructions, the problematic between geological data vs reconstructions based on magnetic anomalies distribution, and to explain the importance of this work. In the discussion, the presented solution will be presented more in detail.

I have some specific comments:

Abstract

Point 2

Reviewer: The many details of the structures make it a bit confused. The abstract could be rewritten to focus on the main outcome of the paper, that is the independent tectonics of the domain investigated and its role in the plate kinematics of the area. Response: I agree and the abstract will be shortened and refocused.

Introduction

Point 3

Reviewer: The introduction does not provide element to understand clearly the rationale of this work. Besides, it does not explain, nor motivate the aim set by the title. The introduction should be a bit streamlined to serve better this purpose. Response: see response 1

Point 4

Reviewer: Details on the structures are redundant, as they are provided clearly in the following sections. Response: Redundant details will be removed

Discussion

Point 5 Reviewer: I don't understand the points made on the kinematics, they are not well introduced. In particular I don't understand the point three, talking about a rotation of 4°, is it calculated by the Author? How?

Response: This sub-section will be reshaped in order to present in detail data used to reconstruct the motion of Iberia and to calculate the rotation of 4°.

Point 6

Reviewer: I find the discussion of the structures redundant, so that the discussion might be the right place to speculate on the implications for the kinematics.

Response: The problem is even worse. In order to lighten the discussion, some rather basic interpretations have been anticipated in the sub-sections describing the structural features. This, however, has attracted the criticism of reviewer#2. In agreement, the discussion will be divided in two sub-sections, which will be focused on the regional geology and plate kinematics, respectively.

Point 7

Reviewer: There are different works published on the kinematics models in this area, not only the two referred to. The inconsistencies in these works might not result from different kinematics set. Also this section would benefit from some larger-scale sketch

and reconstructions.

Response: part of this problematic will be anticipated in the introduction, where large-scale sketches will be used and other works will be cited.

Interactive comment on Solid Earth Discuss., 4, 507, 2012.