

## ***Interactive comment on “From subduction to collision in the Parautochthon and autochthon of the NW Variscan Iberian Massif” by Francisco J. Rubio Pascual et al.***

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The manuscript by Rubio Pascual et al presents a thermobarometric study on several samples from the so called Autochthonous and Parautochthonous domains (NW Iberian Massif) concluding that the uppermost parautochthonous nappe, composed of Upper Paleozoic syn-orogenic rocks with high-pressure relicts, is another nappe of the so called Lower Allochthon. Additionally, several tectonic schemes are included.

The manuscript is well written, the length of the sections is balanced, and the figures and tables are well presented (see specific comments on the figures contents). However, the manuscript is not well organized, the content of some sections (2, 3 and 4)

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does not correspond to the headings and it is difficult to distinguish what are the (mainly structural) new contributions of this work. Besides, important regional references are missing. The metamorphic study is relevant (see comments and specific observations below) but it is not fully supported.

Specific comments by sections:

Section 1;

L43; “. . .and other correlatable Variscan suture outcrops of the Iberian Massif. . .”. The OMZ has been classically considered a composite terrane with domains of different origin, separated by strike-slip shear zones, but without a proven tectonic relation between them (see e.g. Simancas et al., 2016; Azor et al., 2019). Recently, this view has been re-interpreted (Díez Fernández and Arenas, 2015; Arenas et al., 2016; Díez Fernández et al., 2016; Abati et al., 2018) suggesting a common origin for the OMZ and the Allochthonous Complexes of NW Iberia, and a correlation between their different units has been proposed. Currently, these correlations are highly debated within the Iberian geological community. Please, reformulate these lines and include the references of the authors who have presented arguments that do not favour these correlations.

L47-48: “. . .some works (Pitra et al., 2010. . .) and new data from the NW of the Iberian Massif, point to a more complex scenario in which part of the considered parautochthonous section experienced HP-LT conditions before the onset of Barrovian metamorphism”. Albite-bearing micaschists (from the Mauves Unit) were ascribed to the Parautochthon by Ballèvre et al. (2009) and Pitra et al. (2010), and subsequently attributed to the Lower Allochthon by Ballèvre et al. (2014) because of its similarity to the Spanish outcrops. These authors do not ascribe Barrovian metamorphism to the Mauves Unit. They just used a different nomenclature, and the Variscan units in the Iberian and Armorican Massifs were later unified (in Ballèvre et al., 2014). Please interpret correctly and cite the appropriate references.

Section 2.1.1 includes a good synthesis on the metamorphism of the different units of

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the Allochthonous Complexes. In section 2.1.2 the same synthesis is expanded with the description of the domain structure, together with the ages of specific structures, and regional deformation phases are presented. Section 2.2 focuses on the depiction of the regional deformation phases and the metamorphism is discreetly mentioned. I think it would bring accuracy to the manuscript to sort these descriptions and follow the same scheme in all sections and subsections. Furthermore, if this description is accompanied by a table/figure that summarises the relationship between the foliations (which are introduced in section 4, along with all the other nomenclature), the deformation phases, the metamorphic events and the (relative/absolute) ages, it would be of great help for potential readers. The nomenclature used by the authors was previously proposed by Martínez Catalán et al. (2014) and refined by Dias da Silva et al. (2017, 2020) and Azor et al. (2019). Please, include the missing references.

In section 3 it seems that the structural arguments that support the proposal of a new tectonostratigraphic sequence are presented. What are the original contributions regarding field and structural data, beyond the simplified schemes presented in figures 2, 3 and 5? Are some taken from references? Please clarify this aspect in the text and include in figures 2, 3 and 5 (or in a new one) cross sections, structural data and images of the outcrops that support this interpretation (e.g. L160, L182... ). It is tedious to follow the reasoning with so much regional terminology. Given the proposed conclusion, it is convenient to standardise the internal divisions of the Parautochthon and to support the arguments presented by establishing their connections with all the existing tectonostratigraphic models. L 150-152 if this interpretation refers to that of Dias da Silva et al. the interpretation mentioned in this text has nothing to do with the one deduced from these authors. According to Dias da Silva & Clavijo (2010): "Under the main Trás-os-Montes thrust plane, in the easternmost region of the Morais Allochthonous Complex, a geologic unit has been identified. It shows syn-tectonic S2-related andalusite blastesis, representative of low-pressure thermal metamorphism. In the studied sector this metamorphism affects essentially the black slaty lithologies present in Neoproterozoic to Silurian formations." Then, Dias da Silva et al. (2014a, b

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and 2016) present a new definition of the tectonostratigraphy and structural boundaries of the Parautochthon in the eastern rim of the Morais Allochthonous Complex (NE Portugal) based on a comprehensive characterization of the Saldanha and Mora volcanic complexes and no mention to HP-LT rocks is made.

Section 4 is entitled "... constraints" but what is presented is a synthesis of the background classified by types of metamorphism describing foliations, metamorphic events, and deformation phases. In this synthesis, what appears to be original contributions of this work are disguised, going unnoticed. Like the great contribution described in section 4.1, which is the report of the ky-zone in this area for the first time. L226: "For several reasons, the HP nappe of the SACG could have a likely continuation in the uppermost part of the Paraño Group in the Verín Synform". For what reasons? Please, specify.

Section 5; Since one of the contributions of this work is the description of the tectonothermal evolution of the studied samples, and the P-T quantification by means of conventional thermobarometry, please, relate the petrographic images in figure 4, and the minerals chemical analyses in table 2 (with backscattered images if necessary due to resolution restrictions) and provide a report of the mineral chemistry that matches the P-T constraints. Also, in figure 4, indicate to which sample does each image corresponds. L265; I do not doubt that the authors' conclusion is correct, but I think that it is essential to develop it further and it must be supported by more robust arguments. For example, when the authors refer to "show high silica contents (Table 2) and a mineral chemistry compatible with HP-LT metamorphic conditions" it is important to develop that mineral chemistry. Si values in muscovite are compatible with those reported in HP-LT rocks. Please show images of the albite porphyroblasts inclusions showing white mica crystals. Describe the albite content in plagioclase and compare this content with those in the samples from the Lower Parautochthon. For example, in the Ceán Schists, albite porphyroblasts, which contain white mica inclusions with similar Si values in muscovite, were thought to contain a relict foliation S1 of HP-LT (López-

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Carmona et al., 2010). However, after studying numerous samples and analysing the included garnets, it was discovered that this foliation is an M2 (López-Carmona et al., 2013), still under HP conditions. In contrast, in the Cambre amphibolites (texturally similar porphyroblasts contain an S3 (M3). How are your albite porphyroblasts related to those of these rocks belonging to the Basal Units/Lower Allochthon (for example, in the Santiago and Ceán Units?)

Minor comments:

Please unify abbreviations consistently in the text (see text underlined in green in the annotated version of the manuscript) Please, unify the spelling in the terminology referring to "parautochthon". It is written in different ways through the manuscript, with and without capital letters.

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Please also note the supplement to this comment:

<https://www.solid-earth-discuss.net/se-2020-25/se-2020-25-RC2-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2020-25>, 2020.

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