

## ***Interactive comment on “Tectonostratigraphy of the Mérida Massif reveals a new suture zone exposure in SW Iberia” by Rubén Díez Fernández et al.***

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Given the nature of the comment, and others before it, we think it pertinent to provide a general perspective so everyone understand the big picture. The authors are deeply surprised by the nature of this third comment to our manuscript (it is a pity that the person making the comment remained anonymous). Perhaps it is convenient to point out that four out of the five authors of the work are petrologists, geochemists, geochronologists and/or isotopic geochemists. That is, we obviously understand the importance of geochemical data to advance in the understanding of complex orogens. However, we are also Basement Geologists, and we know that all that type of data

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is useless (or may lead to misunderstanding) if we do not start by having a very clear idea of the geological context in which they are obtained. We think that doing Petrology-Geochemistry-Geochronology based only on geo-localized samples collected without a fine knowledge of the Regional Geology at hand is a waste of time and money.

To address any work in complex basement regions, it is absolutely necessary to distinguish between lithological units (if any), following consistent criteria. In basement regions classified as "complexes" (it should be remembered that these are regions constituted by different terranes with different origins and tectonothermal evolutions), the recognition of tectonostratigraphic units (or terranes) is something prior to any other data acquisition. This requires a lot of field work, a lot of track runs and a lot of mud in the boots and hours under the sun, rain and cold. That is, it is essential to create good quality maps and geological cross-sections, and also to generate a systematic knowledge of the lithological groups in the area. Only this methodology allows to recognize the existing terranes, according to their lithological coherence, tectonic contacts with other rock groups, contrasting tectonothermal evolution, etc. For us, it has been disappointing that our anonymous reviewer has not been able to perceive the need for all of this to advance in the geology of the Mérida region. In order to objectively assess the contribution represented by the manuscript submitted to this Solid Earth volume, it is convenient to do the quick exercise of comparing the maps and cross-sections previous to those presented here.

At this point, it could be useful to review the history of geological progress in the NW of the Iberian Massif, keeping in mind that this special volume is in honor of Dr. Martínez Catalán. In that region, the geology of the internal zones was first described in modern terms by Parga Pondal and many scientists from Leiden University, who built a regional database based on the recognition of different geological entities defined as "Complexes". This is how the Cabo Ortegal Complex, the Órdenes Complex, the Morais Complex, etc. emerged... It was in 1986 (Arenas, Gil Ibarra, González Lodeiro, Klein, Martínez Catalán et al., Hercínica) when the tectonostratigraphic units of these

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complexes were collectively described. This step allowed the correlation between complexes, and from there, shortly afterwards, the recognition of the different continental and oceanic domains (ophiolites) that all of them share, thus reaching a point where it was possible to go further and start talking about the terranes involved in the assembly of Pangea from a NW Iberian perspective. This essential methodology for scientific progress in complex basement regions had not been applied until a few years ago in the SW of the Iberian Massif, which in our opinion may have led to considerable confusion. Our research group has been working in the SW for some few years now, following the steps given in the NW decades ago. We have begun to identify ophiolitic units that had gone unnoticed, or had been confused with other types of units. These ophiolites may define a suture or several sutures, we are still working on that, but the recognition of a new ophiolitic unit is, by itself, a contribution that deserves publication in a SCI journal (with all respect to extended abstracts...). The discussion about our research increases, which we assume as logical, although we think that the workflow based on: 1) differentiation of tectonostratigraphic units in the SW of the Iberian Massif; 2) correlation to SW scale; 3) SW-NW scale correlation; 4) correlation to the scale of the Variscan Orogen; has arrived here to stay.

The basement geologists have exciting challenges of enormous complexity before us. Constructive collaboration can help us move forward and capture resources for our research lines. We believe that our work is a valuable contribution to the geology of the SW of the Iberian Massif and, in particular, for this volume of Solid Earth, who is dedicated to a scientist who has contributed to significant advances in the geology of the Iberian Massif following approaches similar the one described here and in the manuscript we present. As it is commonly used in the fashionable Soccer World, we ask for a little RESPECT, for everyone, including the honoree.

That being said, in the following paragraphs we will provide specific answers to the comments posed by the reviewer.

Referee's comment #1: "The extremely appealing title and nice abstract of this

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manuscript by Díez Fernández et al. initially caught my attention and invited me to accept its review with the greatest interest. If correct, this topic would attract the interest of many researchers of various disciplines, myself among them! However, I needed several successive readings to finally realize that the only data presented are those making the structural map and sections. Other than these, only interpretations are given from the very beginning, which is really disappointing."

Authors' reply #1: We are sorry we did not meet the reviewer's expectations. But it is important to note that here, the reviewer is likely unaware that he/she is contradicting him/herself. He/she says we are presenting data, but a few lines below he/she also says we are not. However, the reviewer, after reading the text several times (as he/she claims) has not realized that there is something else other than the map and cross-sections. This reviewer is apparently missing the brief description and listing of lithological ensembles that we propose. Such a thing took many days of observation and data collection in the field and microscope, as well as an effort towards concision in presentation, but perhaps the reviewer did not think about it.

Referee's comment #2: "If the authors want to prove that an (Neoproterozoic) oceanic affinity unit, and therefore a (Cadomian) suture are present in the Mérida area they should document this with geochemical/isotopic data."

Authors' reply #2: As we already said in a previous reply, geochemical/isotopic data by their own do not prove the oceanic affinity of a unit. It is the recognition of the rock association that works best, and it is what we are presenting here. In other words, you could travel to any of the world-class examples of ophiolites without carrying an ICP-MS in your backpack, and yet you would not hold a doubt about the ophiolitic nature of what you are looking at in the field. Once again we recommend some reading about the ophiolite concept.

Referee's comment #3: "Most rocks of their mafic/ultramafic unit have been previously interpreted on the basis of their geochemistry as arc-related" (Bandrés, 2001; Bandrés

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et al., 2002, 2004). A discussion of this apparent controversy can be only sustained with data, which as said, are missing.

Authors' reply #3: The objective of the paper is not discussing the geochemistry and petrological processes involved in the generation of the rocks of the study area. Therefore we do not need to present geochemical data. The main objective of the paper is presenting data that sustain the existence of another ophiolite in SW Iberia, and we do not need geochemistry for that. Remember, you would not carry an ICP-MS in your backpack. . . We do not see any controversy between what we propose and an arc-related setting. We just skip that type of discussion because we are not presenting new data to do it. We think it is an honest approach from our part. Moreover, in the Geological Setting section, we acknowledge such a regional setting for the rocks we study. Perhaps the reviewer should read the manuscript one more time to note this.

Referee's comment #4: "In addition, you should not claim for an oceanic suture and not to mention the nature and correlation of the two juxtaposed continental blocks, apart from describing the accretion process."

Authors' reply #4: There are oceanic sutures of many types, and it is perfectly reasonable to claim for an oceanic suture when you recognize an ophiolite. We are not claiming for any correlation between the continental blocks, we are just identifying them as such, which is more than enough to claim for a suture zone if they are separated by an ophiolite. Funny to read that we are, in a way, allowed to "describing the accretion process". Accretion means a gradual increase or growth by the addition of new layers or parts. From a geological perspective, accretion usually takes place in relation to suturing of oceanic basins (where many ophiolites come from. . .), i.e. in relation to the underthrusting of a lithospheric slab along a subduction zone. In a way, the reviewer is accepting the main idea we are sending with this manuscript.

Referee's comment #5: "I presume the authors have data of those kinds, otherwise I do not understand how convinced the seem to be of their interpretation. I invite them

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to enlarge their manuscript and incorporate those data, even if they are thinking in publishing them in a higher rank journal."

Authors' reply #5: Very easy to understand. Our conclusions are independent from geochemistry. Our conclusions rely on basic Structural Geology, basic Igneous and Metamorphic Petrology, basic Tectonics, and a modern understanding of what an ophiolite is.

Referee's comment #6: "Without them, this is more an extended abstract, with a nice map and sections, than a paper."

Authors' reply #6: This sentence (and some others before) is a piece of art. It synthesizes the view of the reviewer about several things. First, the comment despises the value of fieldwork. And more importantly, the value of the data geologists can obtain in the field to support by their own some important interpretations and scientific discoveries. We strongly believe fieldwork is essential and the first step towards more oriented research in Geology. Second, the comment does not recognize a geological map and cross-sections derived from it as data valuable enough to be presented alone in a scientific paper. It seems to us that the reviewer consider this type of data as secondary, as worth it just for a minor purpose. It is sad to remember this here but, a geological map takes many days, weeks and even months of fieldwork to be complete. Not to mention that it requires insight in many regards proper of a scientific contribution. Someone could even say that doing a map may take much longer (and more money and insight. . .) than analyzing n samples for geochemistry. A geological cross-section is a thorough synthesis in 2D of the more or less complex 3D structure of a region, which also takes time and much experience to be recognized and properly represented. Maybe the reviewer did not think about it but a geological map and derived cross-sections may include (implicitly) more numeric (quantitative) data than many of the analytical tables you can find in a research paper today. Many geological maps have contributed decisively to our understanding about our planet, so please, change your mind. Third, we are not sure if the reviewer is happy with concision in

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Science. It seems that there is a minimum length for a manuscript to be considered as a valid scientific paper. Those contributions that do not reach such length would be just extended abstracts, wouldn't they? We recommend the reviewer to contact the Editorial Board of scientific journals such as Geology, Terra Nova, Science, Nature, and many others that (sometimes only) accept quite concise contributions so he/she can explain them what they are doing wrong.

Referee's comment #7: "I really look forward to seeing the data sustaining your interpretation."

Authors' reply #7: You have them already.

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