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Solid Earth Discussions

Interactive comment on "Deciphering the metamorphic evolution of the Pulo do Lobo metasedimentary belt (SW Iberian Variscides)" *by* Irene Pérez-Cáceres et al.

Anonymous Referee #2

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1. General comments. This paper focuses on the characterization of the low-grade metamorphic conditions of the Pulo do Lobo Zone. For that, 18 metapelites were studied with several techniques: X ray diffraction (mineralogy, KI and b), RSCM, EMPA and chlorite geothermometry. The results of this study have allowed to correlate two phyllosilicate growth events with different deformation/metamorphic phase and to establish the PT conditions of these events with more detail than the more general previous works related to the South Portuguese Zone. The results are shown clearly, what facilitates the reading and understanding of the article (discussion and conclusions). In any case, there are some aspects that can be improved. Some suggestions and little corrections are indicated below and some others are included in a pdf file.

2. Specific comments. At the end of the abstract, lines 48-49: please, include data: the range or an indication of the celadonite content (e.g. <X apfu), the range or average of b dimension and something more specific for the low P gradient. Keywords: Include a keyword relative to the illite "crystallinity". As for section 3 (Samples and analytical methods): Authors should add some information in Methods section about the Scanning Electron Microscope used. The information relative to the EMPA at the University of Huelva is too short in comparison with the EMPA study in Grenoble. Please, add information about analyses time and standards. Line 276: Which T of formation? the T of mica formation? Lines 341-344: if you say this, please justify or give the reason why two of them were excluded. As for section 4 (Results) Lines 369-370: Is this observation important for something? It is not very coherent with the comment in lines 241-242. In relation to the comment in lines 374-376, please add a column in Table 1 with the KI corresponding to the bulk fraction. Lines 393-395: As for the KI you have low-grade metamorphic conditions (epizone). And C/S is compatible also with low grade metamorphic conditions as you say also in line 493. So, I recommend to delete "very low-" and even "the presence of C/S". Line 395: in general, you use frequently "low-P metamorphic gradient" along the paper, please be more specific, what do you want to say with low-pressure gradient? Line 412: Please indicate with a value (< X Å) what it means low b parameter and the same for the d001 (> X Å). Lines 419-420: Could you justify this assertion better? Only because is poor in sudoite? Poor in sudoite but higher in... Lines 443-447: Please check the T ranges and several comments included in the pdf file revised. Discussion Line 471: Table 2 should be cited later, at the end of 5.3 section for example. In lines 490-491 I think the comment it is not significant. As well, as far as I know the Bourdelle thermometer is mainly calculated for low P and low T (< 350°C) so these results should not be considered. Line 498: this value (KI 0.14) is the boundary of something? I feel lost. Clarify in the text. Lines 511-513: These temperature ranges based on several methods (figs 4d and 7 and Table 1) are not very clear. How have you selected these final ranges from three intervals (one for each method)? In sample 84 you have selected from the lowest T to

the highest one, but in the two other samples? Lines 530-532: This parameter (KI) is used for low-grade metamorphism, you are talking about T much higher (until 450°C!!) than the estimations we can do with the illite crystallinity (epizone, 300-350 °C) The use of colors in the table 1, although it said it is a relative colour bar, is a bit confusing considering that KI and RSCM give different T ranges for the lower formations. Figure 7: Why are not used the same ranges of temperatures for red and blue hystograms? The blue columns are wider..so the comparison is not straight.

3. Technical corrections. Line 99-100: “allows to know” Lines 292-293: Please use lowercase as in line 300 Line 361: According

Please also note the supplement to this comment:
https://www.solid-earth-discuss.net/se-2019-143/se-2019-143-RC2-supplement.pdf

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