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Interactive comment on “Low titanium magmatism in northwest region of Paraná continental flood basalts (Brazil): volcanological aspects” by F. B. Machado et al.

Anonymous Referee #1

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The authors present petrographic and chemical data on samples from the NW region of PCFB and provide temperature estimates of the feeding magmas based on different mineral thermometers. Overall the paper is well structured and contains detailed information on the petrography of the PCFB lavas, however, I found hard to identify the principal aim of the study. The motivations for this study and the aim should be better explained before going through the description of the samples. Also I would recommend a very careful review of the English language, some parts of the manuscript were not very clear and I had to read many times to understand. Finally, I would suggest the authors to separate the part of temperature estimates from the mineral chemistry and put into a discussion section, possibly adding some petrologic implications for different

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types of magma in PCFB.

Major comments:

1) Is the Ti range of the two sets of sample really different? The authors declare in the abstract that the LTi magmas contain less than 2% TiO₂ (Ribeira), whereas the HTi magmas more than 2% TiO₂ (Pitanga). This classification is in clear contradiction with table 1 that shows just one analysis for HTi magmas and many analyses of LTi magmas which TiO₂ content is higher than 2%. How can a reader tell the difference if the authors just put analyses in the text? Table 2 is also in contradiction with table 1 and it would be superfluous if all the analyses were reported for both types of magmas.

2) The authors use many different models to get crystallization temperature for these magmas. What is the error of each model and are they really consistent one to each other? It doesn't seem so. But more importantly, what is the implication of these numbers? I suggest the authors to make a little effort in giving some more interpretation to this part and make a discussion out of it, rather than jumping to the conclusion (see specific comment Line 488-491 + Table 3).

Specific comments:

Line 21: ...on the basis of the TiO content... Line 22: Remove therefore Line 23: there is an overuse of "which" everywhere in the text (which I don't think is always grammatically correct). Ex of I would use it: ...portion of PCFP, which volcanological and geochemical aspects have been poorly investigated. Line 26: are commonly associated Line 30: What is the connection between the rheology and magmatic temperature? Line 31-33: too many parentheses Line 33: ranging from 1069°C to 1248°C and from 1020°C to 1201°C respectively.

Line 71: and also the longest Line 78: Several authors (...) Line 81-84: specify when Line 96: use that rather than which Line 104-105: which composition is used? Also, put these numbers into a table Line 109: Remove further Line 115-119: this part

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is unclear Line 120: remove therefore, ...studied the petrology and geochemistry of the basaltic... Line 123: replace where with that Line 125: remove furthermore, It is important... Line 128: where the possible Line 151: analyses Line 158-162: remove the oxide list Line 171: well selected? Line 182: ..., which exclude any... Line 195-197: Not clear Line 206-208: any implication for depositional mechanism?

Line 267: Olivine is common... Alteration minerals have been identified... Line 301: how do you define rheological? Line 301-310: this part is unclear

Line 316: classified in a total alkali vs. silica diagram (Le Bas et al, 1986) Line 332-335: put tables, not numbers in the text Line 342-343: figures are in contradiction with table 1 Line 357: why not use ppm? Line 375: TiO₂ range not consistent with table 1 Line 381: is the variation in the MgO range large enough to define one type more primitive than the other? What are the implications then? Line 405-412: remove all these numbers and ration and put them in a table Line 420: I missed this part about intrusive basalts

Line 465: I would divide this section and start a discussion here, starting with a paragraph in which the authors present and discuss the temperature estimates that they get. Line 488-491 + Table 3: what is the crystallization sequence? Are these temperature ranges consistent one to each other? What happens when the temperature is in between the T range for Px and Plag, or Px-Opac? Is it really possible that the dT for plag is only 30°C? The compositional variation of Plag looks too wide. What analyses did the authors use? This part is a bit lacking of information and needs a better discussion.

Figures in general: please use two colours or symbols for the two magma types (HTi - LTi) Figure 7: why use the entire TAS and not just part of it? All the points are indistinguishable Figure 14: use a magnification of this diagram

Interactive comment on Solid Earth Discuss., 6, 2215, 2014.

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