

# ***Interactive comment on “Application of geophysical tools for tree root studies in forest ecosystems in complex soils” by Ulises Rodríguez-Robles et al.***

## **Anonymous Referee #2**

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In my opinion, this is an interesting, original and apparently technically sound study. However, please note that I am not an expert on the technicalities and hands-on details of GPR and ERT techniques and data analyses, so I strongly recommend additional review of the more methodological aspects of the study by a real expert on these geophysical techniques. The paper is concise and very well written, and I think that it represents a valuable contribution that significantly advances current scientific knowledge in a clearly underrepresented field in the literature (i.e. vegetation rooting and water uptake patterns in ecosystems with very shallow soils). At the same time, I appreciate that the Discussion section ends with an honest acknowledgement of the caveats, limitations and technical problems encountered with the application of GPR

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and ERT techniques in the field.

L23 in Abstract: There is a typo in the spelling of ERT.

L3, page 5: please be more precise (you mean that sensors were inserted at 12 cm depth only when allowed by bedrock?)

L18, page 6 and elsewhere: Please consider the option of using the terms "bedrock" and "weathered bedrock" (instead of just "rock") whenever appropriate, and please replace throughout the text.

Line 10, page 9: leaf litter accumulates under exfoliated rocks, or on exfoliated rocks (L26, Page 10), or both?

Lines 14-17 in page 8 and again in Lines 16-18 in page 11: this appears like an unusual rooting pattern, did you find any other published papers reporting similar rooting patterns in oaks or in other tree species? Can you provide any references of similar findings?

Line 27-28 in page 8: Why is this finding so surprising, am I missing something here...?

Line 10, page 9: only leaf litter accumulated under rocks? what about root litter, was it also present under rocks? Were you able to distinguish between living and dead roots?

Line 7, page 12: Please clarify what exactly is meant by regolith here (weathered bedrock only? all types of bedrock?).

For the sake of clarity, please rephrase item IV in lines 11-12 of page 12, this sentence is a bit confusing.

The quality of the figures is rather good, although I have some suggestions for improving Fig 5 (whose size in the final version should be at least twice as big as that in the PDF version that I have reviewed). I was a little confused by the legend of Fig 5, as it is not clear to me whether the three layers mentioned in the legend (soil, intermediate, bottom) are depicted or delineated in any way in the figure or not...It appears that

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only the water potential categories are represented by different colors. Also, please note that some of the "soil" water potential values shown in this figure (-24 MPa) are extremely and unusually low for soil and require further clarification. I guess these values represent water potential values for dry bedrock, not soil. Also, applying the terms "Increasing rock moisture content" and "soil water potential" to the same moisture potential data appears rather contradictory. For the sake of clarity, I recommend to change to "Soil/bedrock water potential" and "Increasing soil/bedrock moisture content"

Figure 3 should also be enlarged in the final version of the published paper. With the current size, it is very difficult to spot the B (in A) mentioned in the legend...

Table 5: four soil DEPTHS....comparing forest STANDS...

The correct reference for Querejeta et al (2007) is:

Querejeta JI, Estrada-Medina H, Allen MF, Jimenez-Osornio JJ (2007) Water source partitioning among trees growing on shallow karst soils in a seasonally dry tropical climate. *Oecologia* 152:26–36

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