

## ***Interactive comment on* “Soil andic properties as powerful factors explaining deep soil organic carbon stocks distribution: the case of a coffee agroforestry plantation on Andosols in Costa Rica” by Tiphaine Chevallier et al.**

### **Anonymous Referee #1**

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I can see that the authors of the study “Soil andic properties as powerful factors explaining deep soil organic carbon stocks distribution: the case of a coffee agroforestry plantation on Andosols in Costa Rica” put some efforts into their study and I found parts interesting. Unfortunately, I also had major problems with the study and I am sorry to suggest that the study should not be published in an international journal.

Comments: 1. Parts of the manuscript are below standard. Unfortunately, important parts of the manuscript are below standard. In the abstract, there is no information on the results of the study. This is unacceptable. The introduction should present the

state of knowledge, open questions, hypotheses and objectives. The authors present two hypotheses which are related to MIRS. One might get the idea that MIRS is the core of the paper. However, half of the introduction (the first three paragraphs) does not deal with MIRS and the remaining part of the introduction does not give specific information on known and open issues with MIRS in the context of the study (which are the known absorption bands, how good was the estimation accuracy in different studies?). Since there are two hypotheses, one would expect two objectives. In fact, there are three objectives, but only one objective deals with MIRS. In summary, there is a need for a major improvement.

2. The core of the study is not sufficiently clear to me. Unfortunately, the core of the study is not sufficiently clear to me. A main focus is on MIRS for which 98 spectra were scanned and where there are also wet-chemical results. In total, however, there are 598 soils and I do not see that the difference (598 - 98, the 500 soils) is really required for this study.

3. The chemometric modelling is not exciting. The authors carried out a LOO-cross-validation for a modified PLS regression using a mixture of replicates and pseudoreplicates (soils from the same profile at different depths). This is not really exciting. More exciting would have been an independent validation, where one makes sure that soils from a profile are kept together in the calibration or validation sample.

4. The anova modelling is not convincing. As above, there are problems with pseudoreplication. In anova, independent data are required. Data from different depths are not independent from each other. Repeated measures anova or a mixed effects model is required.

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Discussion paper

