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Solid Earth Discussions

Interactive comment on "Land use change affects biogenic silica pool distribution in a subtropical soil toposequence" *by* Dácil Unzué-Belmonte et al.

Anonymous Referee #1

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The study of Unzué-Belmonte et al. is very interesting, well written and based on very new techniques. It combines the old story of soil element depletion by erosion and negative effects of deforestation on soil Si pools shown by Struyf et al. 2010. However, despite the manuscript being well written and the data being well discussed I have two major concerns about the manuscript.

major concerns: The first is the complete missing of any statistical analysis. Without statistical analysis it is a descriptive description but nothing is really proven. The second concern is that the authors confound the source of available Si in soils (line 34, line 48, line 383). It is only to minor share the phytoliths which have a high silica condensation state and hence a very slow dissolution. But a much more important source as part of the plant material are the amorphous plant silica deposits like the silicon double layer which has a very low condensation state and is thus highly dissolv-

able. Phytoliths are more or less stable in nature under common soil conditions. You mentioned it in line 389-391 by indicating phytoliths as a permanent sink for carbon as others found. Phytoliths are not easily dissolvable in soils, otherwise they would not be there for geological scales. Phytoliths are paleo indicators!

minor points: line 14: change to "which negatively affects"

line 116: Sit and Alt should have the same style like in the formula

Table 1 should go for supporting information

line 260: "Highest concentrations were mostly found at the bottom of the slope in every site" this is really no new fact and should not be highlighted that much

Figure 3 and line 379-380 you found no effect of deforestation on biogenic Si pools for gently slop. This is an important outcome contradicting the paper of Struyf et al. 2010. Deforestation is not that bad for soil Si pools, at least for low slopes. This should be highlighted more both in the abstract and conclusion.

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