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Interactive comment on “Organic and inorganic carbon in the topsoil of the Mongolian and Tibetan grasslands: pattern, control and implications” by Y. Shi et al.

Anonymous Referee #2

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This paper studied the amount of soil organic and inorganic carbon in Mongolian and Tibetan grasslands by collecting 81 soil samples. The study is rather interesting to understand the C deposition in these two areas. However, some concepts in this paper are not clear. For example, authors often used the expression “SOC in soils”. This is wrong. That is to say “soil organic carbon in soils”. Another is that authors mixed “organic matter” with “organic materials”. They should replace “matter” on L10 of P1871 and L7 of P1881 with “material”. Special concern is the method for measuring soil pH. Authors measured soil pH using CaCl₂ solution. This is not a good chance for acid soils because exchange Al and others will be extracted by it, resulting in the reduction of soil pH. Thus, authors should not measure soil pH with CaCl₂ solutions (please see

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the method). I think if they measure using different extraction solution, they will get different results and explanations. I also concern how authors build up the relationship between plant types with SOC (how to transform plant types into figures). Please show it in the part of Materials and methods. Anyway, I will recommend it for publication after the major revision.

Other minor revisions:

1. P1882, “This pattern can be explained by two reasons. Firstly, acidification inhibits soil microbial activities and thus the SOC decomposition rate (Francis, 1986). Secondly, N deposition, a major cause of acidification, will lead to a decrease in microbial biomass and oxidase activity (Dalmonech et al., 2010; Fisk and Fahey, 2001; Zak et al., 2008) and to an increase of SOC inputs through increasing vegetation productivity (Neff et al., 2002)”. To my knowledge, N input could also stimulate the growth of microbes and oxidase activity. I think N input mainly stimulate the plant growth and release more organic C into soils thereafter.
2. L7 of P1888, please delete “R”.

Interactive comment on Biogeosciences Discuss., 9, 1869, 2012.

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