

Interactive comment on “Livestock enclosure with consequent vegetation changes alters photo-assimilated carbon cycling in a *Kobresia* meadow” by J. Zou et al.

Anonymous Referee #1

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<Livestock enclosure with consequent vegetation changes alters photo-assimilated carbon cycling in a *Kobresia* meadow>

This manuscript addressed the effects of livestock enclosure on (1) species composition and structure of plant community, and (2) ecosystem functioning, as reflected by plant aboveground productivity, and C partitioning using C isotope pulse labeling technique. In general, this study could be valuable toward better understandings of C process in alpine grassland, but I believe it needs further measurements to make the conclusions more robust. My major concern is the experiment design.

As the authors mentioned, the effects of enclosure on grassland are controversial,

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some of these uncertainties arise from grazing intensity, vegetation type, and the specific environment. In the current study, 4 quadrates within and 4 quadrates outside a fence in the research station were used for all the community and functioning measurement. From a statistical point of view, this comparison only reflects the variations in this specific site, and cannot be extended to other site. In short, the design of the current study lacks true replication between sites, which makes the conclusion very weak.

Secondly, the authors state “At the experimental site, a total area of 100×100m was fenced for ecological research in 2005 to exclude yaks, sheep and goats.” I do not believe this is true. I have ever visited the station; it seems the fenced area is inside the observatory area of the station, 30-by-30 m at largest. I do not know why the authors expanded the fenced area in the manuscript, probably also related to this pseudoreplication.

Thirdly, studies related to grazing effect also need consider the grazing intensity.

Therefore, the current manuscript at the present status cannot answer their research questions efficiently, a revised version with more measurements could make it publishable in Biogeosciences.

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