

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

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We thank the reviewer for the comments in the interactive discussion, and our reply in response to these comments is as following:

There are many uncertain factors influencing the ecosystem functions combined with livestock enclosure, such as vegetation type, grazing intensity and so on. In our research, we choose a *Kobresia humilis* meadow as our study subject to find the response of the meadow under reasonable grazing management to livestock enclosure. Therefore, only one factor is considered in our experiment design, land use types. In our experiments, either the vegetation investigation or the stable ^{13}C analysis involves two treatments, the meadow with livestock enclosure and the meadow under continuous grazing.

We conduct our experiments inside the observatory area of the station in the Haibei Alpine Research Station. The *Kobresia* meadow where our experiments were performed is a typical *Kobresia humilis* meadow characterized by a long evolutionary of grazing. It is a winter grazing pasture grazed from 1 January to 30 March. The grazing intensity is moderate with 3.51 sheep ha^{-1} season $^{-1}$. The fenced meadow (100m \times 100m) in this study was established in 2005 (Fig.). It is adjacent to the east side of the weather station, and excludes yak and sheep during the whole year. We use four plots for each treatment and distribute them all at random within the experiment area, in either the vegetation investigation experiment or stable ^{13}C analysis. Four plots were selected in the fenced area (the livestock enclosure treatment), while four plots were in the grazed

area outside the fence (the grazed treatment). We assure the replicate plots are dispersed in space and independent with each other. Because our experiment sites situate along the valley floor, the intrusion influences from the sources such as slope, soil types and other features can be reduced to make our results conclusive.

Our interest is primarily in a comparison of the two grassland management types in a *Kobresia* meadow, excluding all livestock out during the whole year and the traditional reasonable grazing, so we feel our experiment design is sufficient and could be efficient to answer our research questions.



Fig. The meadow under livestock exclosure by fence.