In this paper, the authors used published data to analyze the variations of soil CO₂ respiration rates and their temperature sensitivity (Q10) across Chinese grasslands. Furthermore, their relationships with some abiotic and biotic factors were analyzed. The results could advance the understanding of the variation and control factors of soil CO₂ respiration rates and their temperature sensitivity (Q10).

The specific comments are as follows:

Line 72: shown

Line 137: Correct the equation 2

Line 148-151: The Q10 values were divided into five soil depth with different soil temperature

Line 178: shown

Line S2: add the measuring methods

Line 192, Fig. 4: Why choose paired sample t-test to analyze the significant differences of the Q10 among the different soil depths?

Line 209: there is no results for the temperate desert steppe in Table 1

Line 233 and Line 239: five soil depths

Line 248: 1.73±0.08

Line 267 Table S4

Line 271-286, most of the contents are descriptive and repeated with results

Line 364 relatively colder and higher than what?

Fig. 2,5: indicate the n values for each regression analysis

Fig. 3 Line 675 (e)and (g)

Table S1: what R² represent for? What the ranges of soil temperature and soil moisture?

Table S2: show the n values. Are there values of soil temperature and soil moisture?

Table S3: show the n values. Are there values of soil temperature and soil moisture?

Fig. S1, S5, S6: show the n values

Fig. S7: is data for method comparison from the same or similar sites? Otherwise, there may be many factors affect the annual Rs and Q10.