

# Response to comments

**Paper #:** GMD-2023-114

**Title:** Modeling biochar effects on soil organic carbon on croplands in a microbial decomposition model (MIMICS-BC\_v1.0)

**Journal:** *Geoscientific Model Development*

## Editor:

### Comment #1

We are pleased to inform you that your following manuscript was accepted for final publication in GMD.

### Response #1

We thank the Editor for recognizing our work on biochar modeling in MIMICS. We have checked our manuscript carefully. Please see the detailed response to the changes made in the manuscript below.

---

### Comment #2

Changes list made in the revised manuscript.

### Response #2

Some minor changes:

- (1) We removed the third affiliation from the second co-author (i.e., Qing Zhao), that is the “[Qing Zhao<sup>2,3,4</sup>](#)” in the original co-author lists was modified to “[Qing Zhao<sup>2,4</sup>](#)” in the revised manuscript”.
  - (2) For **Eq. 2-5**, **Eq. 12**, **Eq. 13-14** in the revised manuscript, we added multipliers “ $\times$ ” between variables (i.e., “ $V_{slope \times T}$ ” in **Eq. 2**, “ $K_{slope \times T}$ ” in **Eq. 3**, “ $e^{c \times f_{met}}$ ” in **Eq. 4**, “ $e^{-1.5 \times f_{clay}}$ ” in **Eq. 5**, “ $(1+a \times n_s)$ ” in **Eq. 12**,  $V_{max} = e^{V_{slope \times T} + V_{int}} \times a_v \times V_{mod} \times f_{mi}$  in **Eq. 13** and “ $K_m = e^{K_{slope \times T} + K_{int}} \times a_k \times K_{mod} \times f_{mi}$ ” in **Eq. 14**).
  - (3) On **Line 235** in **Section 2.2**: The unit of the desorption coefficient  $f_d$  was modified from “ $ha \ t^{-1} \ Rate\_BC$ ” to “ $ha \ t^{-1} \ C$ ”.
  - (4) On **Line 245** in **Section 2.2**: The unit of the decomposition rate coefficient  $f_v$  was modified from “ $ha \ t^{-1} \ Rate\_BC$ ” to “ $ha \ t^{-1} \ C$ ”.
  - (5) We adjusted the order of **Fig. S8**, **Fig. S9** and **Fig. S10** in the revised manuscript.
  - (6) On **Line 425** in **Section 3.1.2**: We added the word “different” in the sentences “To explore the possible effects of soil moisture on SOC dynamics through affecting different processes (Section 2.3.2), ...”.
  - (7) On **Line 451** in **Section 3.2.1**: The “(Fig. 7e-f)” was modified to “(Fig. 7e-g)” in the revised manuscript.
  - (8) The Section of “**Code and data availability**” was updated to: “**Code and data availability.** The codes of this model version and simulation data are available at <https://doi.org/10.5281/zenodo.11065423> (Han et al., 2024).”
  - (9) We added additional funds, and the content of the **Acknowledgements** was modified to: “This study was funded by the Yunnan Provincial Science and Technology Project at Southwest United Graduate School (grant number: 202302AO370001), the National Natural Science Foundation of China (grant number: 42192574, 42022056, 42377417, 42175169), Tsinghua University Initiative Scientific Research Program (grant number: 20223080041), Guangdong Major Project of Basic and Applied Basic Research (2023B0303000006) and GDAS' Project of Science and Technology Development (2020GDASYL-20200101002, 22022GDASZH-2022020402-01, 2022GDASZH-2022020402-02).”
-