Thank you once more for constructively reviewing our manuscript. Reviewer comments are in black, our reply is in green, and passages cited from the revised manuscript are in grey italics.

I suggest the authors either describe better the CO_2 injection leak estimation protocol, or for better and more useful results, conduct a proper leak test like I outlined in my previous comments.

The minimum to do is to specify the length of the observation period after CO_2 injection and how the reported difference between calculated and observed CO_2 concentrations was assessed: was the reported inside CO_2 concentration obtained as just the highest single CO_2 concentration observed after injection, or if it is the average concentration over some time window (and what the time window was), or what is it.

Of real use would be to make an estimate of how much air is exchanged between the inside and outside of the coffin per time unit, which can be estimated by measuring the CO_2 concentration outside the coffin and inside the coffin during a specified observation period, such as 10 minutes or a half hour. The central point here is that leakage is always present in a closed-loop system of this size, and the remedy for leak is to estimate the leak rather than pretend it's not there.

We now specify the length of the observation period following CO_2 injection (5 min in a 5 sec interval, which also matches max. chamber closure time during CO_2 and ET flux measurements in our setup. Thereby, we follow the common guidelines for closed chamber measurements (Pirk, N. et al. 2016; Maier et al. 2022). Further, we report how the difference between calculated and observed CO2 concentrations was assessed in a more clearly manner within the MS (L170-180):

"To check for the suitability of the sliding window to sufficiently seal the Greenhouse Coffin airtight when closed and exchange air when open in its final setup (complete hardware implementation), we repeatedly injected distinct amounts of technical gas containing 1,000,000 ppm CO_2 ranging from 15 to 450 ml into its sealed headspace using a syringe. Prior, during, and after each injection, chamber headspace CO_2 concentrations were continuously recorded in a 5-second interval using an infrared CO_2 gas analyzer (LI-850, LI-COR Inc., Lincoln, USA) connected to the inlet and outlet of the coffin. In more detail, the following procedure was opted: (1) After the sliding door was closed and stable CO_2 concentrations were obtained (ca. 1 minute), (2) technical gas was injected into the chamber headspace, and CO_2 concentration development was recorded over the next 5 minutes before (3) the sliding door was opened again and CO_2 concentration depletion was monitored until stabilization (ca 1 minute). The average CO_2 concentration of the initial 1 minute (12 records; after closure and before injection) and last 4 minutes (48 records; after injection/stabilization and before opening) of CO_2 concentration records were then used to calculate the change in CO_2 concentration from before to after injection (ΔCO_2 in ppm). In case of proper sealing of the coffin, the thus determined ΔCO_2 should match the calculated mixing ratio."

During the 5 minutes observation period following each injection (- 1 minute for stabilization (mixing of chamber air) of CO_2 concentrations directly after injection), measured CO_2 concentrations were stable and did not show a decline over measurement time. Only after the sliding door was opened again, CO_2 concentrations rapidly reached initial values, indicating proper/sufficient sealing during the measurement period.

While we agree that a determination of how much air is exchanged between the inside and outside of the coffin per time unit would be additionally interesting, to our understanding, this would require a box in a box setup (chamber around coffin). Only thus would concentrations around the coffin be stable enough to detect the potential minimal CO_2 concentration changes that can be expected and are indicated by our tests. Otherwise, the common fluctuations in CO_2 concentration present in a greenhouse setup (e.g., respiration by scientific staff (also those injecting the technical gas), diurnal cycle, etc.) would interfere with accurately assessing leakage at such low levels.

References:

Pirk, N., Mastepanov, M., Parmentier, F. J. W., Lund, M., Crill, P., & Christensen, T. R. Calculations of automatic chamber flux measurements of methane and carbon dioxide using short time series of concentrations. *Biogeosciences*, *13*(4), 903-912. (2016).

Maier, Martin; Weber, Tobias K. D.; Fiedler, Jan; Fuß, Roland; Glatzel, Stephan; Huth, Vytas et al.: Introduction of a guideline for measurements of greenhouse gas fluxes from soils using non-steady-state chambers. In Journal of Plant Nutrition and Soil Science 185 (4), pp. 447–461. DOI: 10.1002/jpln.202200199. (2022)