*Interactive comment on* "Decomposability of soil organic matter over time: The Soil Incubation Database (SIDb, version 1.0) and guidance for incubation procedures" *by* Christina Schädel et al.

**Anonymous Referee #2**

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The authors present a new database for soil incubation time-series experiments and an R package built for compiling and using the database. The development and compilation of the database was a considerable effort that holds promise for synthesis and meta-analysis activities that the authors hope will both improve our understanding of soil carbon decomposition dynamics and our ability to model soil carbon cycling in Earth System Land Models.

Overall, I find this effort to have been a valuable one with a useful product that warrants publication in ESSD. I find the incubation suggestions and summaries useful and appreciate the point they make regarding the importance of including additional in-

formation to increase the use of experimental results in synthesis and meta-analyses (how could anyone not provide soil moisture for an incubation experiment???). I have two major concerns: 1) that the R package does not seem to be appropriately documented or vetted (e.g., it is not in CRAN? there seems to be no package vignette or examples?) and 2) that the authors invite others to use and contribute to SIDB, which is excellent, but there is no discussion of how they will maintain (or have performed on the current version of the database) QA/QC to prevent the ingestion of incorrectly entered datasets.

Additional minor comments are below:

L156 should read "a CO2 analyzer"

L364 this statement would be stronger with examples not from permafrost (certainly there are some, at least for peatlands!)

L441 I find this example a bit too simple to be very interesting, but I am puzzled by the argument that we should chose the 3-pool model even though the 2-pool model fits the data better. I do not understand why this statement (that the 3-pool model is better) is needed at all as the point is to provide a simple example of what can be done with this type of data. It seems to me that they're approaching this example with a paradigm that 3-pool models are better than 2-pool models, and that this is a distraction from the point of the manuscript. If the authors truly think that the 3-pool model is more consistent with our understanding of soil C dynamics, they should provide more rationale, including citations from the literature. Is this not the sort of question we should be using databases like this one to revisit? Could there not be a similar argument that some kind of feedback is more realistic than a parallel structure given our current understanding of soil carbon cycling? This could either be better developed into a more interesting example and discussion regarding what we can learn from this data about soil carbon model structures or or the basics of the example should be presented without suggesting the statistically "best" model is not the one the authors

like best.

L461 delete the comma after "However" it is not needed with this usage

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