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Comment on bg-2022-56

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Community comment on "Modeling nitrous oxide emissions from agricultural soil incubation experiments using CoupModel" by Jie Zhang et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-56-CC1>, 2022

The manuscript provide results from a short-term (43-day) factorial incubation experiment to investigate the ability of a process-oriented model (CoupModel) to estimate N₂O and carbon fluxes, and soil mineral nitrogen (N) dynamics. The manuscript is well written, it fluently flows and the whole structure is coherent with the adopted approach. To my opinion, all three objectives indicated by authors at the end of the introduction were satisfying investigated. This would make the paper suitable to be published.

However, many similar works were developed and published through years, reporting similar issues and conclusions. This make the novelty of the paper very poor, despite the large work done. To overcome this huge limitation, I suggest authors to be more proactive at presenting solutions on how to solve the detected issues under current modelling limitations. Within the text, in fact, only general suggestions to cope with these issues are reported (i.e., revisit basic model assumptions and equations, increasing high-quality measurement data, etc.), but none proper solution (new equations to implement and their description, description of further steps in soil incubation experiments, previous chemical analysis to do, etc.) and related changes in final results were reported. I understand that this is not the primarily objective declared within the paper, but since an exponential number of modelling works were published in the last 30 years, a step forward to indicate how to overcome these limitations would be done.