Comment on egusphere-2022-141
Anonymous Referee #2

Referee comment on "The effect of static chamber base on N₂O flux in drip irrigation" by Shahar Baram et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-141-RC2, 2022

Review for Baram et al.,

In general, the manuscript is well and clearly written. In the manuscript authors aiming to resolve spatial variability issue in static-chamber based measurements of soil N₂O emissions from drip-irrigated systems.

The study is comparing in situ measured soil emissions of N₂O from two different positions of chambers, adjacent to the dripper and dripper inside of the chamber. Then authors using numerical modeling to explain observed differences between the two positions and to estimate “true” flux.

- Calculating cumulative emissions – why don’t you use linear interpolation? I do not think that your results will change, but I think that use of arbitrary Q10 is not any better than to estimate cumulative/daily flux using linear interpolation. Calculation of daily emissions can be done by dividing annual accumulative emissions by number of included in cumulative flux estimation days.


- Why do you think that your modeled emissions are better than observed? I think that
for real answer if static chamber methods under- or overestimate real fluxes a comparison between static chambers and eddy-covariance based measurements is needed.

- You are using 3D flow model and some simple assumptions, you may model the water flow well, but I doubt that you can model N2O emissions. At least DayCent model, after ~30 years of development can not.


I think that the manuscript of acceptable quality and importance and rising very important question of how to scale-up field-based measurements of soil gaseous emissions.

a) with all problems of using static chambers they provide good information on treatment differences and b) models today not ready to provide good estimation of field emissions. Therefore, static chambers will be used in the near future.

I am wondering if your proposed method to calculate optimal chamber (base) size for field measurements of soil N2O emissions (monogram) will provide better flux estimation. I think that few weeks of additional measurements comparing the proposed “optimal base size” with bases used to acquire data for the manuscript under discussion will improve the manuscript. If you are claiming that using modeled flow of water and nutrients, you can determine the optimal chamber – prove it.