

## ***Interactive comment on “Hydrogen dynamics in soil organic matter as determined by $^{13}\text{C}$ and $^2\text{H}$ labeling experiments” by Alexia Paul et al.***

**Anonymous Referee #2**

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This is an important paper in the context of understanding of hydrogen dynamics in soil organic matter. The paper is well written and sound. I believe the backline story about Tritium detracts from the main study research outcomes as the context of tritium remains only touched upon, as we get no real concrete data about the concerns raised line 64/65. There is mention of enhancement tritium entering the environment due to historic bomb-testing but no mention that tritium is a radioactive form of H (half-life 12.3 years), unlike  $^2\text{H}$  and  $^1\text{H}$  who are stable isotopes, so will over time will dissipate and has done already decline since the bomb- $^{14}\text{C}$  peak. The authors should either reduce the tritium context or make it more quantitative. The authors may wish to comment on the potential of water in the air (different isotopic H signature) to enter the experimental jars and when opening them to prevent anaerobic conditions occurring in the jar tremendously (line 229) maybe find another word to describe the vary large increase

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observed. For Figure 2 and 3 the scale on the y-axis between the various soil types are different, which makes immediate comparisons difficult. If, the authors want to retain this, maybe indicate in the legends of Figure 2 and 3 that this is the case "note, the scale of Y-axis varies between the subfigures".

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