We thank the referee for the relevant comments which allowed us to improve the first version of our paper.

The referee comments are reported below with the answers we provided for them.

Anonymous referee#2

This is an important paper in the context of understanding of hydrogen dynamics in soil organic matter. The paper is well written and sound.

1. *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 2H and 1H who are stable isotopes, so will over time will dissipate and has done already decline since the bomb-14C peak. The authors should either reduce the tritium context or make it more quantitative.*

   Answer: We decided to reduce the tritium context in the text but we want to keep in readers mind that such a study on hydrogen dynamics in soil organic matter could be used for the prediction of tritium fate.

   Action: We reorganized the paragraph in the introduction about tritium in the line 60 p. 2.

2. *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*.

   Answer: By taking the value of the saturation vapor pressure at 28°C (28 g/m^3), the amount of water contained in the headspace jar (0.17 dm^3) was 4.8 mg. The proportion of labeled water vapor lost by the renewal of incubation jar headspace was estimated at 0.7 % the first months and 2 % at one year. The impact of the atmosphere renewal on the isotopic composition was therefore neglected.

   Action: We provided information in section 2.2.3, p. 4/5

3. *Tremendously (line 229) maybe find another word to describe the vary large increase.*

   Action: We removed the word that was not appropriated in this case.

4. *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'

Action: We changed the legend of figure 2 and 3 in this way.