Anonymous Referee #2

Thank you for your helpful comments. We address all of them in our replies below and in most cases have modified the manuscript accordingly, which is in each case indicated in our reply.

Ad Comments

…For example, a statement about the performance of resistivity measurements, which were also used to estimate the gas bubble fraction although in a different set-up, would be interesting…
We added few sentences to the end of Discussion commenting on the performance of the resistivity method.

P2 L50: Could you please specify which fault zone is meant here?
Thank you, this was not indicated. We clarify that this is related to the hypocenter trend.

Table 1. CarbonNet monitoring network: Hartoušov, the 105.8 m deep borehole is not mentioned in the description of the network in the main text (unless I missed it). Is the borehole used as the reference borehole for the integral method described in the following?
Thank you for this comment. No, this borehole is operated in a closed regime, so the integral method cannot be tested there. We added few sentences to clarify the origin of the borehole, in particular:
„In 2016, a 105.8 m deep borehole was drilled in the Hartoušov mofette with the aim of studying geo-bio interactions (Bussert et al., 2017). It showed a CO2 overpressure of 5 bars and was converted to a closed monitoring borehole with continuous measurements of downhole pressure and temperature and wellhead pressure. A broadband seismometer was installed in 70 m depth in the year 2019"

P6 L183: "ceiling of the aquifer" the term seems strange to me, I assume it means simply the top of the aquifer.
OK, we changed to top.

P9 LL 260 – 264: ".... that the gas bubbles have to appear at the penetrated section of the Hartoušov borehole. This allows us to determine the mean volumetric fraction of the bubbles using eq. (3) with h1(t) = hm(t) being the hydraulic head measured at the depth dm = 4m, and h2(t) = he(t) being the hydraulic head measured in any depth below the bubble entry depth, which we suppose to be at the upper part of the penetrated section at de = 20.5m (Fig.3)."
The statement is confusing to me. If the gas bubbles enter the borehole at the penetrated section, how can the upper part of the penetrated section be below the bubble entry depth? Is the hydraulic head for he actually measured in the Hartoušov borehole or in the reference well mentioned before? I assume the latter is the case according to Figure 4. Could you please clarify the text here?
You were right that the formulation was confusing. Our understanding is that the bubbles enter the borehole at the upper edge of the perforation, which was not clear before. Now we slightly changed the wording by modifying –'in any depth below the entry point' to 'at the bubble entry depth (or anywhere below)'

P10 L 307: What is the observed mass flux at the teste site?
Based on the measurements of Nickschick et al. (2015) (2-100 tons/day over an area of 350 000 m²) the flow rate through the borehole section would be in the order of 1E-8 kg/s. We added this estimate to the text.

P 10: Section: Laboratory test of bubble fraction method: Could you please state clearly here which bubble fraction method was tested in the laboratory, the integral or the differential method? I assume the latter is the case.
You are right, we mention it now in the text.

P 11 LL 346 – 350 (Section: Laboratory test of bubble fraction method): I assume the statement, that the integral method performs better than the differential method, is purely based on the observed correlation of the field data and not supported by the laboratory tests.
Yes, the reviewer is right because the integral method could not have been tested in the laboratory.

Although, I agree with the statement it seems to be a bit out of context here.
Thank you for this comment. The section 2.5 in fact deals both with the laboratory tests and with the tests at Hartoušov. Accordingly, we renamed the section to 2.5 Tests of bubble fraction method

Furthermore, why is a different time window utilized for the differential method in Figure 5 and Figure 6?
In Fig. 5 the aim was to find the volumetric fraction values with highest possible range so that we can compare the results with laboratory results – that's why time windows from 2016 (differential method) and 2018/2019 (integral method) were chosen. In case of Fig. 6, where we compare only integral and differential method itself, our aim was to choose the same time interval for both methods. Unluckily, due to many technical issues, we were only able to choose the plotted time windows (Jun-Sep 2018 and Jan-Apr 2019), which are close to each other and have approximately the same length.

Maybe a separate section discussing the differences in more detail would be better here including the statement on P13 LL 432 – 436, which I assume refers back to Figure 6 and not Figure 5.
Thank you for this comment. In fact, the discussion of Figs. 5 and 6 was a bit mixed up. Now we corrected the figure number from 6 to 5 and added a sentence introducing Fig. 6.

P12 LL 385-386: This statement should be followed by paragraph P12 LL 392-399. The small rearrangement would make it easier for the reader to follow, that there is a large effect on the data due to barometric pressure variations and that these have to be corrected. Maybe that could also be explicitly mentioned, although it is implicitly clear.
We have rearranged it accordingly, also in agreement with the Rev#1 recommendation.

P8 L238 and 243: φ_O should be capitalized
Thank you, we have corrected it

P10 LL 319-321: Figure 5 should be referenced here.
Thank you, we have added it

P11 L338: This should be Figure 5 and not Figure 6.
Thank you, we have corrected it