We thank the reviewer for his insightful comments. This is most appreciated and will help improve the revised version of the MS.

The reviewer had raised two major and three minor concerns.

Specific comments/questions	Response
2 – Major items: Introduction (Lines 156-159): Previous simulation works taking into account superimposed tectonics events have *"not been well-represented*". What do the authors mean here? Do they mean that no study was carried out on the topic or that the quality of the previous studies is too poor? Please be more specific by introducing few references and by explaining why those studies were not properly carried out.	We will expand and explain in more detail the gap in the knowledge and/or in the literature with more literature cited.
Line: 328: Simulations are run in the 2-D domain. Please specify this in the abstract. Line 341, Equation 3: Please specify the friction coefficient(s) assigned to the fractures and ideally, justify these values based on published works.	Consider it done.
Line 411: The matrix permeability is assumed constant and equal to 2 mD based on Whitaker et al. (2014)'s work. However, this later work shows that a large number of deposits have a permeability ranging between 50 mD and 5000mD (Fig. 7 in Whitaker et al). Could the authors explain selecting such low value? Besides, the mean effective permeability of each FSS ranges between 0.85 and 3.24 mD (see Table 2 and Lines 608-613 in the submitted manuscript). Does it mean that fractures in the platform top have minor to negligible impact on overall bulk rock permeability if considering higher permeability for the host rock? Is there any published permeability measurement from the Latemar platform? If so, please add it in the methodology section for comparison purposes.	Thank you for pointing this out. In the revised version, we will explain the rationale for selecting the low matrix permeability value in detail. Carbonate rocks generally have very low matrix permeability with average values ranging from 2 to 4 x 10^{-15} m^2. We acknowledge that in some places, due to diagenetic, the matrix permeability of different carbonate lithologies can be very high, reaching up to 5 D. See Whitaker et al. (2014). We constrained our values to 2 mD, which is only an indicative approximation, judging from similar study areas with the same geodynamic conditions. This means that changing these values can change the final calculation of the effective permeability. Still, the workability of the model

	remains stable and robust and can compute any given matter. Assigning higher matrix permeability values at the platform top would increase the bulk permeability. For this reason, we used an average matrix permeability value to gauge the impact stress on fractures within the Latemar platform. We will add other permeability measurements for the Latemar platform in the methodology section with relevant citations.
In the methodology section 3.1 (Line 295): The magnitude of the two far-field stress regimes is assumed. Which criteria these assumptions are based on? In line 475, it is mentioned that those boundary conditions are "feasible" for modelling compressive settings. Please be more specific on what "feasible" means here.	See the above response for matrix permeability. To clarify further, the stress magnitude values mentioned here only indicate approximations from similar study areas with the same geodynamic conditions. This means that changing these values can change the final calculation of the effective permeability. Again, the workability of the model remains stable and robust and can compute any given matter. In the revised version, we will explain this better as the rationale or criteria behind our assumption. Thank you. We will be more specific in the revised version.
Stylolites are assumed as flow conduits despite controversy on the topic as stated in Line 297. The simulation results and conclusions on the enhanced bulk permeability caused by stress-induced fracture opening (Line 877) are thus optimistic and this should be stressed in the conclusion. Note that the assumed low permeability of the host rock (2 mD) as discussed in the previous comments also adds to the overall key impact of fracture on increased permeability reported in the submitted manuscript.	Good point. Will be detailed in the revised version of this paper.
3 – Minor items: Lines 122-124: Odd grammatical structure of the sentence. Please rephrase. Lines 125-126: If possible, please add any practical examples of change in the flow pattern	Consider it done. Good point. The revised version will provide more detail.

of reservoirs or storage sites caused by stress changes during injection/extraction of fluids. This would strengthen the relevancy of this work.	
Section 3.1.1: The methodology to collect data on fractures are well described. What about the stylolites? Were they also collected using the same methods? Could you add information about this in this section?	Thank you. Yes, we will add information about how stylolite data were collected. However, for the geomechanical modelling (or numerical workflow), we treated all modelled features as reactivated fractures that control the fluid flow. We advanced the argument that "because of the effects of weathering and exhumation, the distinction between open fractures, veins, stylolites and shear fractures was not made in the model. Making these distinctions in our modelling workflow will complicate the whole process and is beyond the scope of this study.
Line 413: Add full stop at the end of the sentence.	Consider it done.
Fig 8: Do the minimum and maximum horizontal stress equal? I have not seen information about it so far. If both stresses are different, it would be good to add a plot displaying the evolution of S_h and S_H with time throughout the simulation period.	Thank you for pointing this out. The minimum and maximum horizontal stresses are not equal. We maintained the minimum horizontal stress value as zero and/or negligible value throughout the simulation period and gradually increased the maximum horizontal stress in load steps, representing Pseudo Time Steps (PST), analogues to quasi-static loading, until a maximum magnitude value is reached. See Figure 8c, showing the evolution of S_H with time throughout the simulation period.
There are three publications of Bisdom et al., 2016. The reference "Bisdom et al., 2016c" is missing in the manuscript (see Lines 672, 741, 747, and 799).	Thanks, consider it done.