Solid Earth Discuss.,
https://doi.org/10.5194/se-2018-11-RC2, 2018


Solid Earth Discussions

# *Interactive comment on* "Correlation between tectonic stress regimes and methane seepage on the west-Svalbard margin" *by* Andreia Plaza-Faverola and Marie Keiding

**Anonymous Referee #1**

Received and published: 16 May 2018

In lines 110 to 113 of authors paper, it is written: "Because the model only incorporates plate spreading, it is likely that the actual stress field on the west-Svalbard margin differs to some extent from the stress field predicted by our model. However, by excluding all other sources of stress, we are able to investigate the influence of tectonic stress exclusively."

I consider this statement demonstrates an error of judgement: the ongoing methane seepage depends on the coupling between fluid pressure and the presently existing complete stress field, as explained here after.

On line 114, authors state that they use Okada model of dislocations for modeling what



they call tectonic stresses. This assumes elasticity. In elasticity, if four different loading processes are considered, the superposition of all of them at the same time implies that the resulting stress field may be evaluated from the sum of the four stress fields computed independently for each of the loading processes.

Authors have listed as loading mechanisms: A ridge opening, B topography, C effect of sediment erosion-deposition, D flexural stresses due to glaciation.

Hence, according to authors, present stress field result from A+B+C+D. Claiming that it can be investigated by looking at A only, implies that B+C+D are negligible. This requires a demonstration! Nowhere have I seen in the paper computations for B, C, and D.

When I say "no reference is made to well documented on going glacial rebound", this is precisely what I mean. I do not mean authors have not cited previous work, I am saying they have not compared the magnitude of the glacial rebound effect to that of ridge opening at the location of methane seepage.

As a reviewer of a scientific paper, I am careful to check facts, not speculations. I do not consider that authors response to my review do address properly the issue of quantifying effects B, C, and D.

I also do not wish to get involved into endless discussions on whether authors understand what is hydraulic fracturing or not, etc. . ..

I just did what I consider the work of a reviewer should be, i.e. check facts or validity of computations; I will leave the editor in chief decide whether my comments are relevant or not.

I will stop here my time devoted to this paper and do not wish to be further involved in reviews for the journal "Solid Earth". Indeed, I am not interested in discussing opinions. . .my small education just helps me with scientific demonstrations within my very small field of expertise...

Interactive comment on Solid Earth Discuss., https://doi.org/10.5194/se-2018-11, 2018.