Review of Vermeesch et al paper on *"Broken $^{206}Pb/^{238}U$ carbonate chronometers and $^{207}Pb/^{235}U$ fixes"*

This paper deal with important issue related to $^{206}Pb/^{238}U$ dating of young carbonate material. It is specifically relevant for carbonate at age range of >1.5 and <100? Ma, that precipitated from fluid with substantial disequilibrium (activity ratios >>1). This contribution explains very well the mathematical problem of the issue and try to advocate for the use of the $^{207}Pb/^{235}U$ system. The paper is very important for accurate calculation and interpretation of geochronological data and is therefore of great interest to the *Geochronology* community.

I have several comments and suggestions for the authors to consider in their revision.
It is important to mention in the introduction previous contributions that mentioned this problem and used the $^{207}Pb/^{235}U$ isochron approach (e.g., Mason et al., Parrish et al. and more).

It would be nice if the author could explain in the introduction the issue of disequilibrium correction from a geological point of view. For example, variations in $^{234}U/^{238}U$ and Th/U ratios in natural systems, the notion of correction of the initial ratio for the whole system (isochrone) and not for each spot analysis (which shows variations in initial U concentrations). I am also interested to know if variation in initial $^{234}U/^{238}U$ could also lead to variations in initial $^{207}Pb/^{206}Pb$? It will be good to frame the issue of disequilibrium correction in the geological context, such as the age range and initial value range that are most critically affected. For example, the section in the conclusion, line 360 onwards, should be in the introduction. It is very important that the reader understand that this problem is not affecting only young ages.

I think there should be a section dedicated to variations in Th/U ratios as it seems like more critical for example in the case of Ash15 sample. Section 7.2 show that uncertainties in initial 230/238 are more crucial for this scenario. Would be good to discuss why 230/230=1 is more appropriate than 0 in that case? Please indicate if possible that ASH15 ID-TIMS data was used for reference material and therefore the corrected age was not needed, only the measured value.

It is important to mention the fact that measuring $^{207}Pb/^{235}U$ on ID-TIMS will always be much better than on LA-ICPMS, so the comparison should be between LA-ICPMS $^{207}Pb/^{235}U$ and $^{206}Pb/^{238}U$.
The former will always have larger uncertainties because of problems to measure ^{207}Pb in young carbonates. The question is then, will uncertainties from variations in initial values be larger than uncertainties in ^{207}Pb measurements? If precipitation is from large reservoir such as meteoric, sea water, lake water etc. we could estimate initial values and provide uncertainties which will be perhaps better than using imprecise ^{207}Pb measurements?

It is also important to discuss potential problems of using ^{208}Pb as a common lead (instead of ^{204}Pb). In particularly when ^{232}Th are high? What will be a limiting concentration from which you will not recommend using it as a common lead? And for what age range (<5 Ma?), or even better, a calculation of concentrations + age combinations?

Overall, I would like to thank the authors for their great contribution to the geochronological community with development of the IsoplotR platform and for keeping improving it by using natural samples to better understand the pressing issues.