

Review of Bar Elisha et al., revised version

Line 15-16: This sentence is incorrect. You do not show/prove that dolomite dating is sensitive to ... „you only discuss this!!!

Line 18-20: make two sentences out of this as these are two things. From my point, you overestimate the necessity of a perfect matrix-matched standard. As your data shows it mixing of different phases during laser ablation is/can be the dominating effect, which yields results that are totally wrong. It hasn't been yet explored (be fair on this and not biased by your opinion) how much inaccuracy non-matrix matched standardization caused in the case of dolomite (No, the paper of Guilliong et al., not has proven this!! it only suggest it).

Line 38: you citing 5 papers that applied U-Pb dating also to dolomite and come with a sentence the it has been "mostly applied to calcite". It confuses the ready a bit.

Line 46: Guilliong et al. does not provide a thorough methodology of dolomite dating, this is wrong. He might suggest/discuss that this is needed. Just as information, we tried to reproduce Guilliong et al. experiments and failed. His approach yields misleading results. There is an effect but it is much smaller.

Line 74: MSWD: write out what it means when you used it the first time

Line 77: this is unclear, Hg contamination?? -> Avoid difficulties related to Hg interference correction on 204Pb.

Line 65-72: as your error ellipses are rather large considering using an MC-ICPMS you should mention the error propagation you used. I assume you added 1% and 5% uncertainties to your isotope ratios. It is hard to understand for many people, why you do this. and this is important information as it might be one of the reasons why your MSWDs are below 2, even when you seem to analyze "mixtures"... I only want you to think about it, but adding this information is crucial !!! and a short comment to me would be helpful to understand.

Line 168: error: the correct expression would be uncertainty and I suggest that you use it from time to time.

Line 168-170: "large error" is relative and you use it in the text for uncertainties of 25% and as well as for <10%. As one can have uncertainties of even 100% I would speak rather from moderate to elevated uncertainties for the range of 10-30%.

Line 170: "Data point analytical uncertainties are smaller than the scatter of the spot analysis" ??? this is misleading and "nonsense"... your uncertainties are elevated and the total range is very small, so it is not a surprise that you are getting a good correlation with low MSWD. First, it is misleading and incorrect to call it an isochron, secondly as everybody knows a low MSWD can result from an overestimation of uncertainties.

Line 186-190: As also outlined by the reviewer, this is not correct and wrong. Guilliong et al. imply that you can have an inaccuracy of 4-8% due to different ablation efficiency but not 40-70%. You also not show that your ablation volume is so different. So ablation efficiency can have only a minor effect on the inaccuracy of your data but the main effect is the mixing of different materials (formed at a

different time). It is confusing for the reader that you seem to favor both processes equally. But it is incorrect and missing any scientific evidence that you can explain this with ablation efficiency!!!

Line 192: the age of 93 \pm 7 Ma is not slightly younger!! **This is incorrect, It is within error!!! This is one of several cases where it seems that you want to influence the reader. Overall I am missing an unbiased presentation of the results. You struggle with the interpretation of your data set (I understand, it is not straightforward) and feel the need to interpret it as it would strongly imply one or another idea. But as you make two processes responsible, the unexperienced reader stays confused as the discussion is overall confusing and not so well structured (jumping from one to another). The ms would improve by a more careful language/discussion, by weighing possibilities better and suggesting possible interpretations instead of implying one and later another.**

Line 210-235: section 3.2: adding this not make the case stronger. You rather confuse the reader more, by repeating what is written before and after... **the effect of ablation efficiency is to my knowledge overestimated and importantly you have no hard data to add much to this discussion. Mixing of material is a much more likely interpretation of what you show.**

Sections 3.3 to 3.5 are the important ones for me, and the reader gets confused by extending too much the discussion of the ablation efficiency ...

Line 362: Careful, this is not an observation you can make based on your data!

Line 364-365: Careful, this is not correct. I can't see this supported by your data!!! Delete this sentence or re-write.