

## ***Interactive comment on “Technical Note: How accurate can stalagmite formation temperatures be determined using vapour bubble radius measurements in fluid inclusions?” by F. Spadin et al.***

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I won't go into the technical aspects of this manuscript because Yuri Dublyansky has already done an excellent job, pointing out some significant issues that require the authors' attention. Thus, I am assuming that the measurements are basically correct, which makes this a very impressive piece of work. That the temperatures they obtain match historical temperatures in the cave is astounding. There are, however, some implications of this work that I feel are worth pointing out.

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Let me backtrack first. A few years ago I was asked to review a paper on temperatures acquired from halite in evaporate sequences. As with the current paper, the fluid inclusions contained no vapor bubble since they were metastable. In the case of the halite inclusions, they froze the samples for days to weeks at which time a bubble appeared. In this paper they use a femtosecond laser to nucleate a bubble, but both situations were similar; inclusions formed at temperatures so low that no bubbles nucleated. As I recall, it had been established that when measuring  $T_h$  of NaCl-hosted fluid inclusions only the highest temperatures were taken as the temperature of formation. Thus one measured away until one felt certain that no additional measurements would be higher and used the highest  $T$  as  $T_f$ . I questioned at the time how one can be sure that measuring 20 more might not have changed the  $T_f$  estimate and I ask the same question of the current work. In this case only the lowest temperature measured is used and all other temperatures are discarded. So, my question is: when have you measured enough fluid inclusions? And how could you ever be certain that enough have been measured. Interestingly, in this case measuring more might lower the  $T$ , while in the case of the halite measurements, more stood to raise the  $T$ . Given the contentious nature of global warming it is scary to think that one could unwittingly modify their results depending on their preferred model. Those measuring halite who would like to see higher  $T_s$  would diligently measure more inclusions while those measuring stalactites might stop sooner. I don't mean to disparage anyone here, as in both cases the integrity of the workers is above reproach, but given the strange politics associated with this issue, it is troubling. However, leaving aside the moral questions, I really would like to know how researchers using this technique would ever know if they have measured enough inclusions.

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