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Interactive comment on "Advecting heating by hot fluids of an Alpine fissure in Lauzière Granite (Belledonne massif, Western Alps)" *by* Emilie Janots et al.

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Reply to referee#1

Minor comments : (1) The orientation of the cleft. We now give the orientation of the cleft that is subvertical but perpendicula to the main foliation. It is also indicated in the legend of the figure 2b. This cleft is subvertical and oriented perpendicular to the main host-rock foliation (N110; Grand'Homme et al., 2016).

(2) Page 9, Line 13 : We rewrite the sentence to show that the fluid origin could have two sources either meteoritic water (where the driving force is hydraulic gradient and

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are topography-driven circulation) or metamorphic fluids produced by dehydration reactions in depth. We also add two references showing that circulations of fluids at mid-crustal depth, in ductile regime is still ambiguous. Based on the mid-crustal depth required for the fluid circulations, it is unclear whether the fluids could be originated from topography-driven circulations of meteoritic water (Diamond et al., 2018; Hofmann et al., 2004; Raimondo et al., 2013), or rather liberated by underthrust rock dehydration due to metamorphic reactions.

(3) Page 9, Line 16 : since the possibility of circulations of meteoritic water remains unclear, dehydration reactions appear as good candidates for explaining this unusually hot fluid circulation in the cleft. This is still very speculative, but we added now a short sentence in that sense Dehydration reactions, with a likely origin in the underthrust metasediments, could be a good candidate to account for the episodic, short-duration monazite precipitation observed in Alpine Clefts in the ECM (Grand'Homme et al., 2016).

(4) Page 9, Line 26 : this paragraph was rewritten in order to take into account the comments of the two reviewers. We agree that we dont know the thermal regime before, and it is clear that the fluid impact will depend on the fluid flux, volume, the difference of temperature between fluid and surrounding host-rock. The impact of the hot fluid circulation on estimating cooling rates from thermochronological data in areas affected by hydrothermal fluid flow may be twofold: (1) by causing locally a transient thermal regime and (2) by fully or partially resetting the ZFT thermochronometer. Nonetheless, this effect may possibly only be of importance in the direct vicinity of the areas affected by fluid flow, depending on the size of the fluid conduit, the duration of the fluid flow event and the temperature difference between the hydrothermal fluids and the ambient temperature of the country rock.

(5) Page 10, Line 31: Cenki Tok et al. Reference was modified (6) We now make reference to the study of Tagami and Murakami (2007) who found a modification of ZFT length in the Nojima fault This result is similar to previous conclusions reached in the

the Nojima fault, where modification of the zircon fission track lengths are interpreted as consequences of ancient thermal overprints by heat transfer or dispersion via fluids in the fault zone (Tagami and Murakami, 2007). As in our study, the effect appears extremely local since it is not seen in samples taken at the vicinity of the fault, especially in the footwall (<0.1 m).

(7) Changes directly proposed in the manuscript were all taken into account

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