

Solid Earth Discuss., community comment CC2  
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## Reply on AC1

Samuele Papeschi

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Community comment on "Interactions of plutons and detachments: a comparison of Aegean and Tyrrhenian granitoids" by Laurent Jolivet et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-11-CC2>, 2021

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Dear Laurent,

You are right: your paper should describe better alternative views in the area but also other views that have been proposed through the years, as I firmly believe that models/ideas can be improved by confronting with different tectonic and geodynamic models, and I deeply believe that the manuscript would benefit from a better and improved discussion of them.

My major concern with your manuscript is that important data has been ignored. For example, the only paper documenting partial melting and deformation in the presence of melt – and to date the best constrain on the metamorphism of the Calamita (Papeschi et al., 2019. *Lithos* 350) has not been considered, the only available age constrain on the Zuccale Fault and syn-magmatic shear zones (K/Ar authigenic illite age Viola et al., 2018. *Tectonics* 39) is not discussed. There is also a plethora of works documenting coeval ductile deformation and pluton emplacement/contact metamorphism, and clearly documenting a transition from dominantly ductile to brittle deformation whose findings suggest top-to-the-E deformation on W-dipping shear zones (Musumeci & Vaselli, 2012. *Geosphere*. Musumeci et al., 2015. *Tectonics*. Papeschi et al., 2017. *Tectonophysics*. Papeschi et al., 2018. *J. Struct. Geology*. Mazzarini et al., 2011. *J. Struct. Geology*. Massa et al., 2017. *Geol. Journal*).

A good regional model has to explain and fit all the structures and evidence coming from field, metamorphic, and geochronological studies, otherwise it needs to be improved. Therefore, I kindly ask you to discuss these findings in the framework of your model.

Regarding the Zuccale, actually there is no such different P-T evolution in the footwall and hanging wall, since the exact same units occur below and above the fault (in agreement with all papers from Keller & Coward, 1996 to Smith et al., 2011; Musumeci et al., 2015). Indeed, regional units (Rio Marina) can be found both above and below the fault and in the Ortano valley you have HT-LP parageneses above the fault. Indeed, the whole structure of the fault has a maximum throw of about 6 km, which makes challenging to link this structure to large scale exhumation. Therefore, irrespectively of the different interpretations, other structures are needed to explain the exhumation from mid-crustal depth that you propose.

Regarding the Zuccale, the recent papers by Moeller and co-workers raise an interesting

question, as they document low  $\beta$  values and clearly state that extension is mostly on high-angle normal faults. I would be very interested to check if your model fits with the reconstructions provided in Moeller et al. or if you can offer a discussion of these papers (2013, 2014; J. Geoph. Research Solid Earth and G-cubed).

Regarding the Monte Capanne pluton, I believe that it would be actually very important to come back on that structure, since other workers on the area have proposed completely different models (e.g. Farina et al., 2010; Pandeli et al., 2018), indicating that there is not agreement yet, about the structure of the pluton. It would be actually interesting for the readership to better document the structures and flow patterns of the pluton, since the numerical model is based on it. I also think the Capanne is really different from the Aegean, as there is no documentation of a continuous fabric from mylonite to cataclasite at the top of the pluton like in the Aegean. Moreover, on Elba, syntectonic deposits associated with low-angle normal faults are entirely missing. (only sedimentary deposit on Elba: pleistocene eolianites). The nearby Pianosa Island shows a major unconformity of Upper Pliocene over Miocene deposits, which is not explained.

All the points raised above are, in my opinion, really major. I am personally genuinely interested to see a thoughtful discussion/confrontation with these data and models, as I believe an improved model and a better depiction of the geology of the area could arise from it. Moreover, it would give the readers a better understanding of the geology of the area, which is to date far from be resolved. As a concluding remark, I do believe that a good, regional, comprehensive model, has to explain all the tectonometamorphic features that are present in a given area.

Therefore, I kindly ask you to check the in-text points we included in the former comment to the present discussion.

Yours sincerely,  
Samuele Papeschi