

U–Pb geochronology of hydrothermal epidote unveils pre-kinematic hydration of highly deformed granitoids

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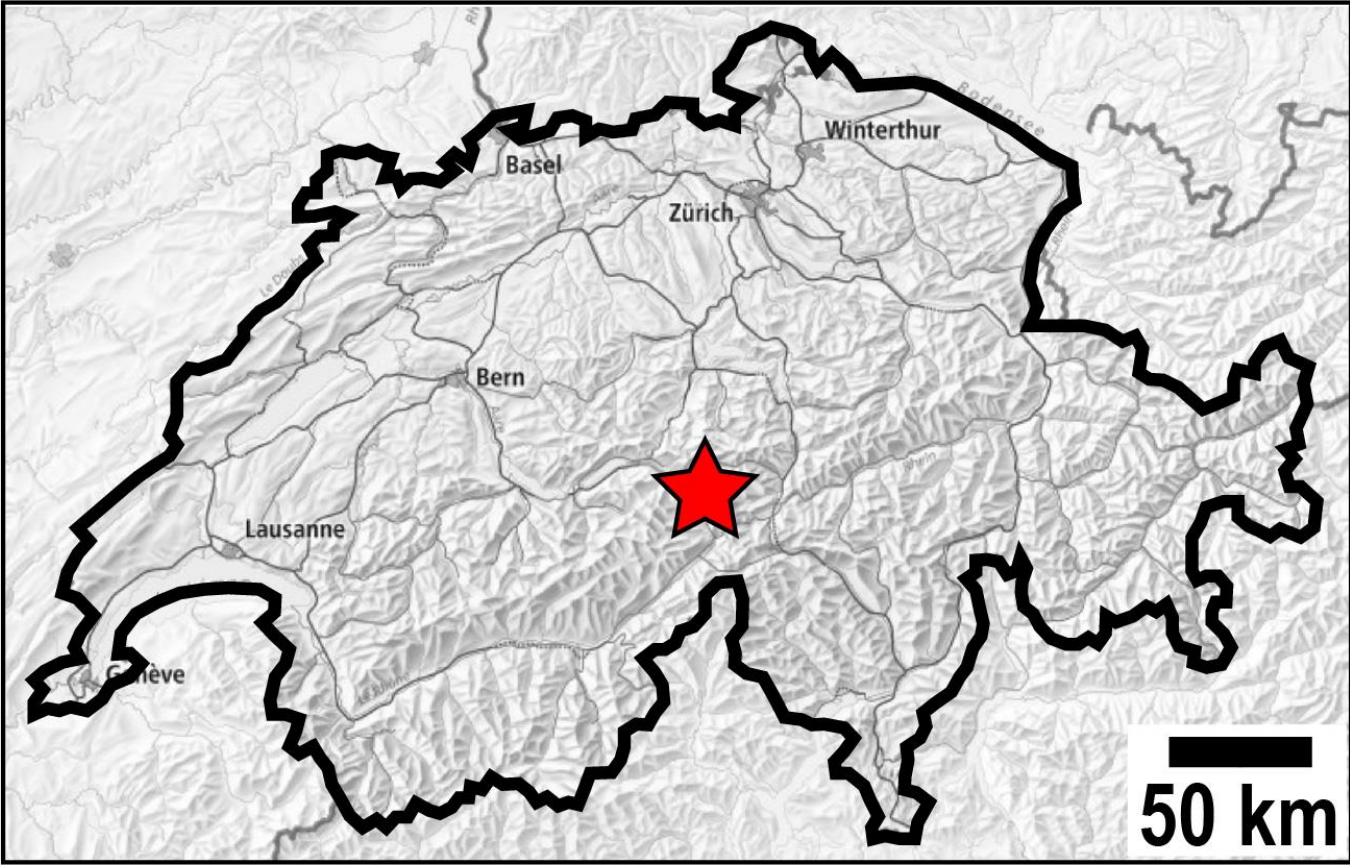
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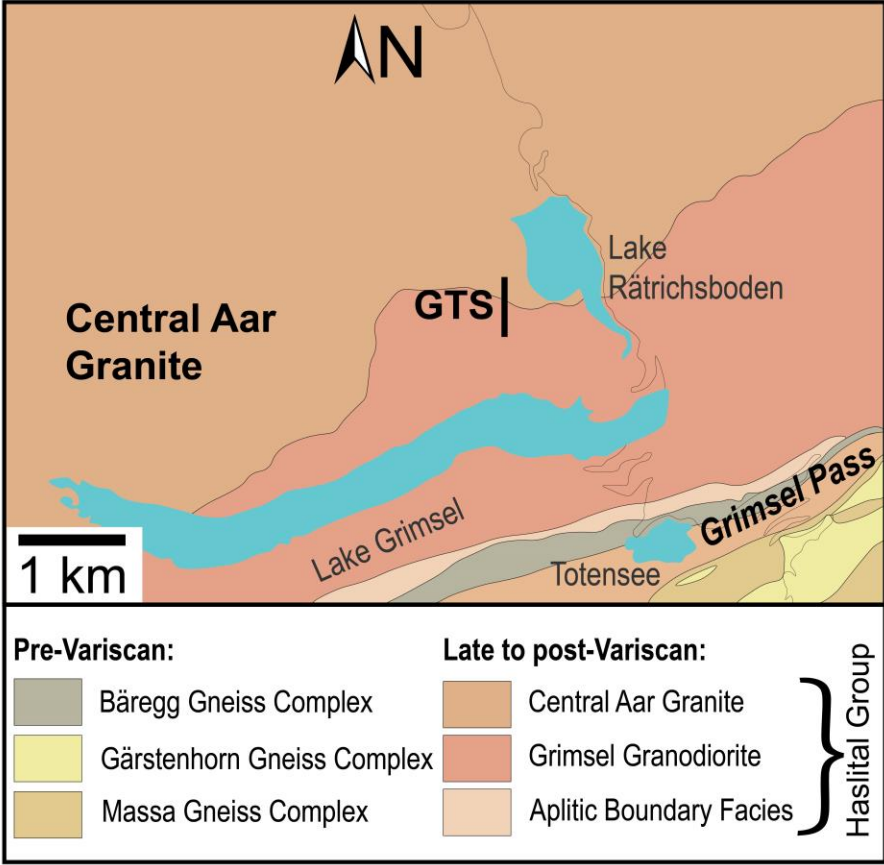
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1 Framework of the study

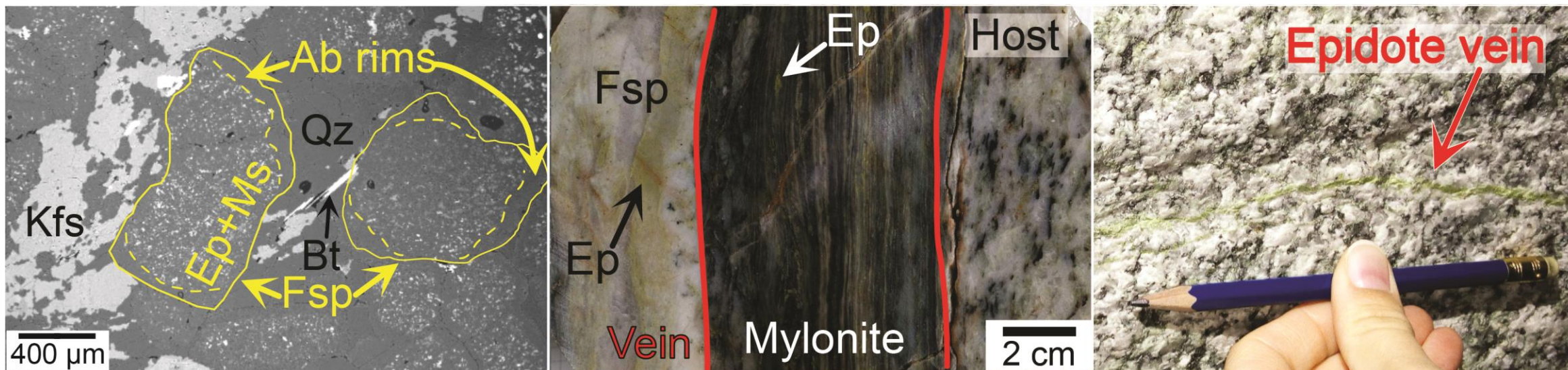


Modified from map.geo.admin.ch



Modified from Wehrens et al. (2016)

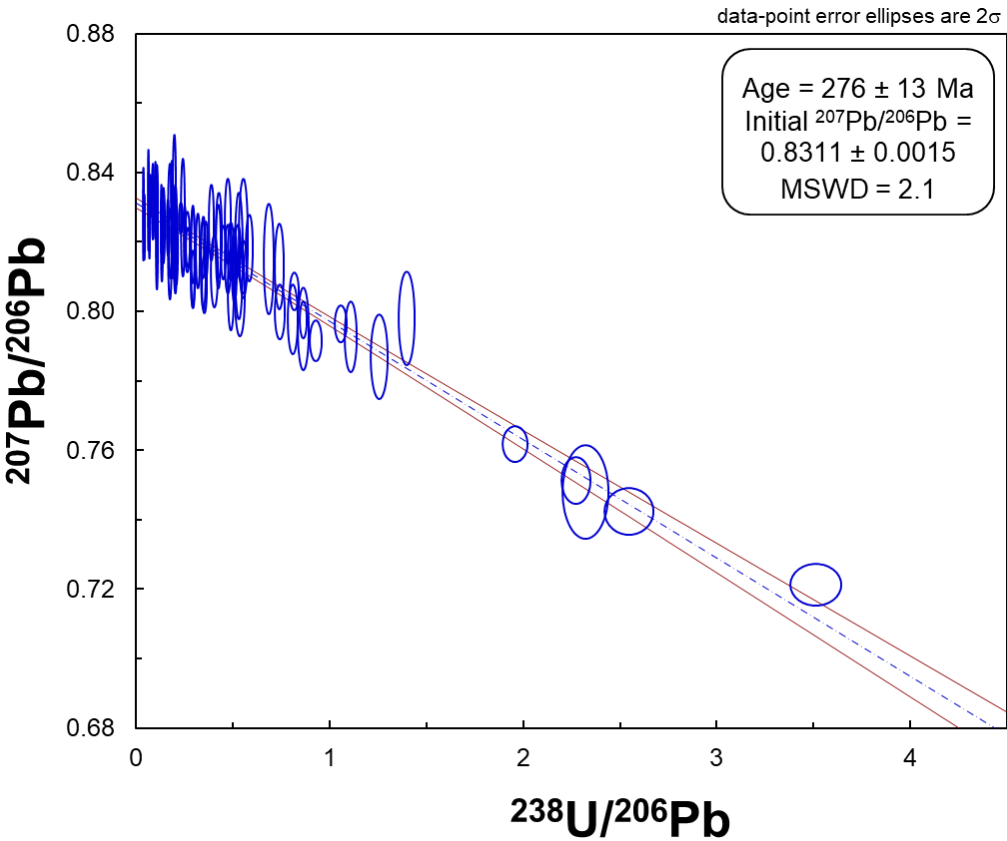
2 Hydrothermal activity in the area



Modified from Peverelli et al. (in press)

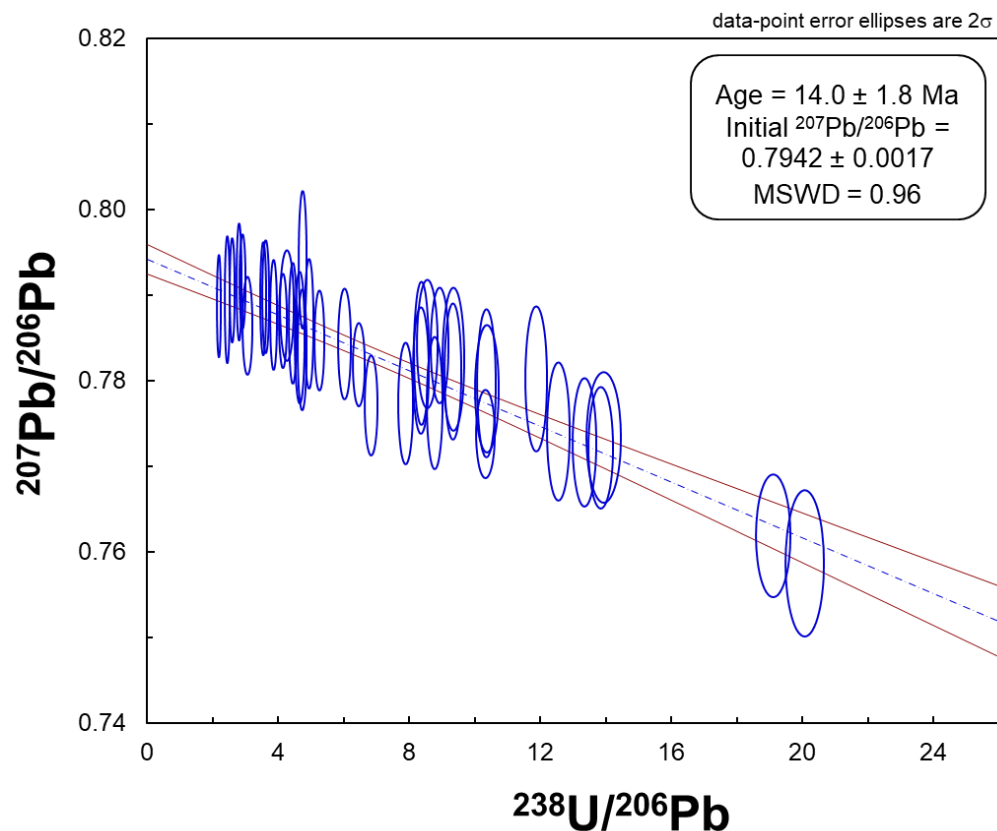
- Hydrothermal activity during Alpine orogeny (e.g., monazite clefts; Janots et al., 2012; Bergemann et al., 2017; Ricchi et al., 2019).
- Other hydrothermal features of unknown age:
→ altered feldspars, **epidote veins** (Peverelli et al., 2021).

3 Epidote U–Pb dating and H isotopes



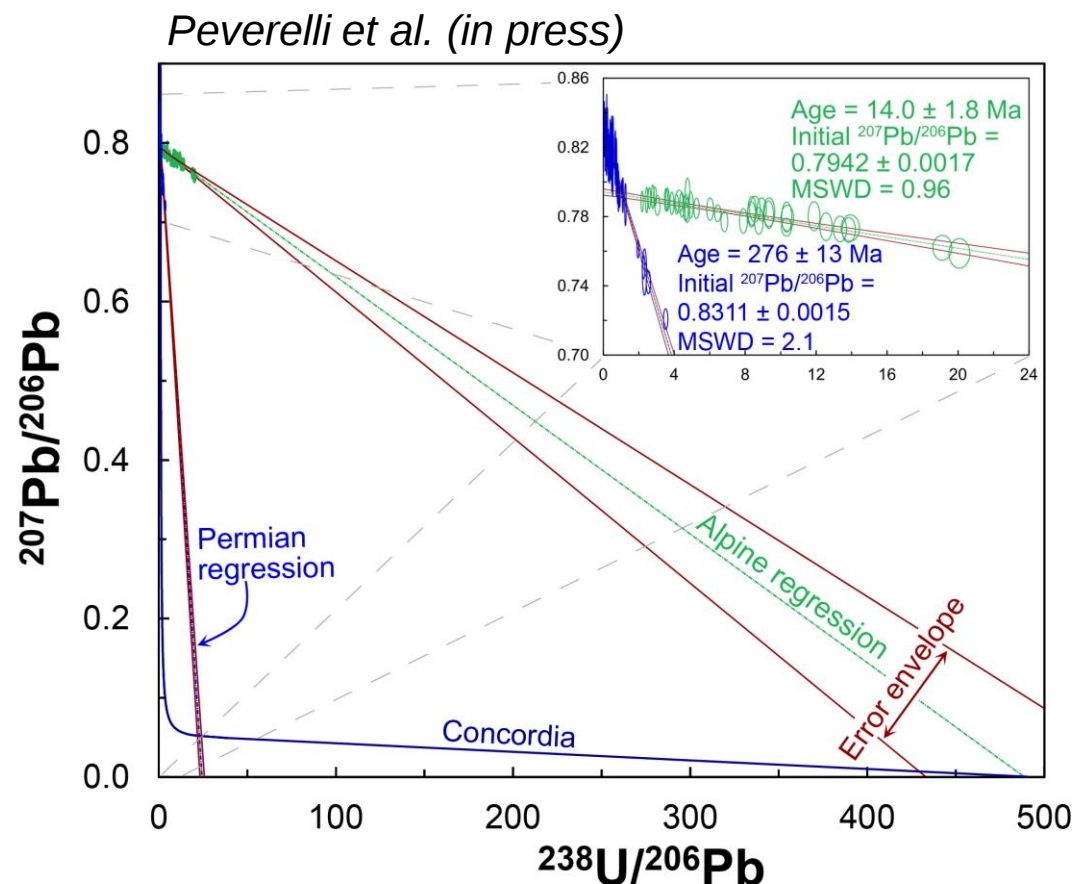
(1) Hydrothermal **Permian** & Miocene veining events.

3 Epidote U–Pb dating and H isotopes



(1) Hydrothermal Permian & **Miocene** veining events.

3 Epidote U–Pb dating and H isotopes

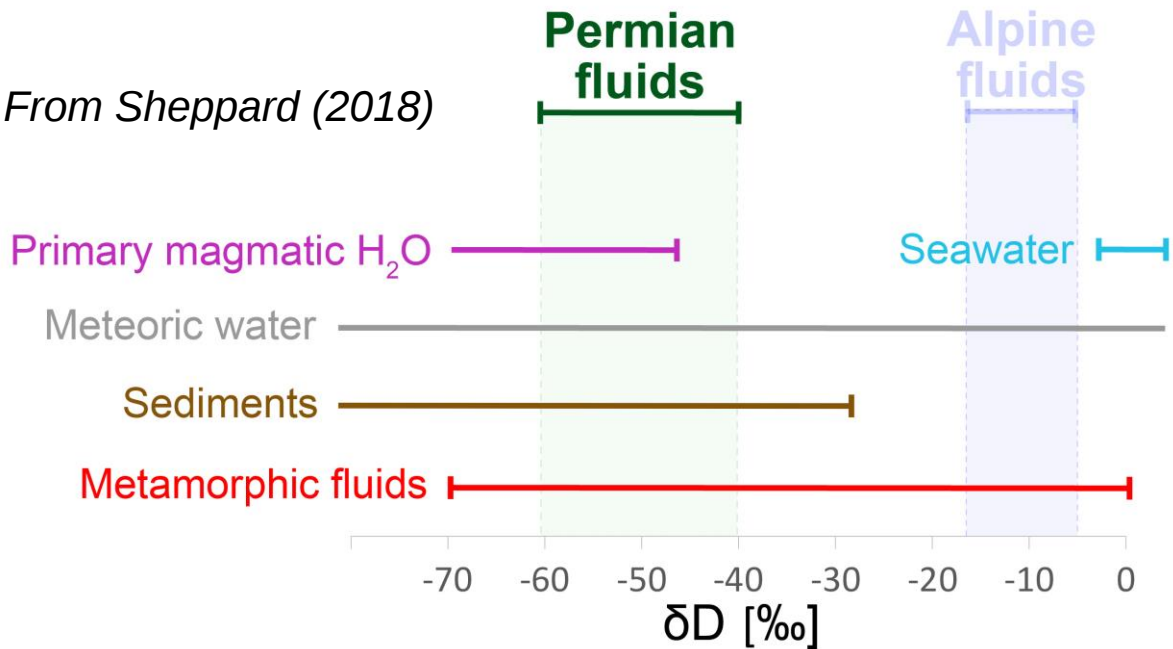


Field relations or microstructures
→ no absolute ages.

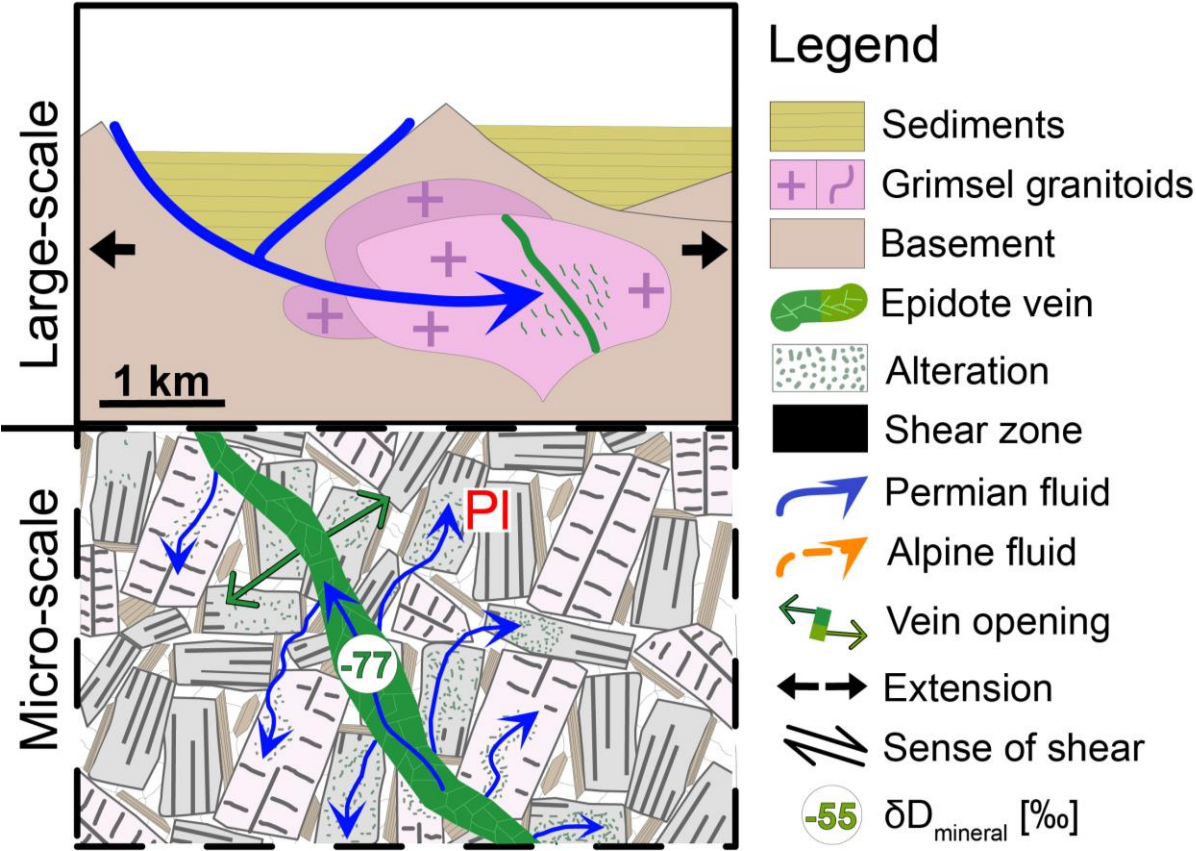
However...

Well distinct regressions in a
Tera–Wasserburg diagram.

3 Epidote U–Pb dating and H isotopes



Permian fluid paths traced by H isotopes.



Modified from Peverelli et al. (in press)

4 Implications

(1) Pre- and syn-orogenic fluid circulation recorded by a new geochronometer:

- **Epidote traces fluid circulation across orogenic cycles.**

(2) Fluids and structural imprint:

- **Some feldspar alteration ca. 260 myr before Alpine orogeny;**
→ feldspar hydration weakens granitoids (e.g., Oliot et al., 2010; Bellahsen et al., 2019; Airaghi et al., 2020).

Thank you!

For more details:

- Peverelli et al. (in press): accepted for publication in *Geology*, or
- veronica.peverelli@geo.unibe.ch

