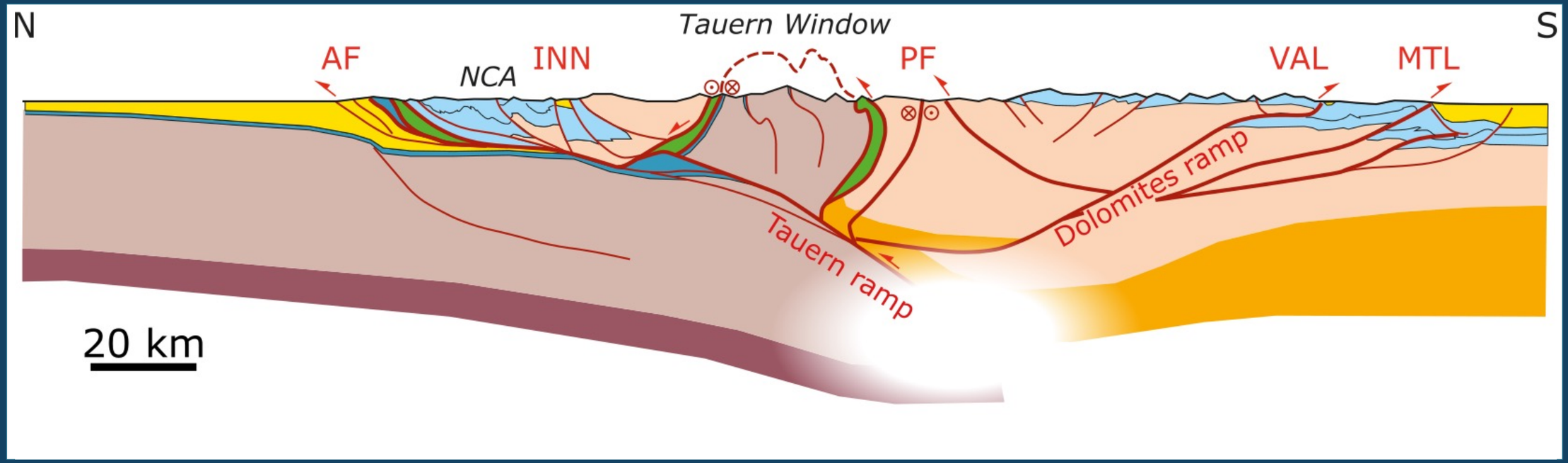
Thermo-kinematic evolution of the Eastern Alps along TRANSALP:

Exploring the transient tectonic state towards slab reversal



Eizenhöfer et al. (under review; Tectonics)

Paul R. Eizenhöfer[1], Christoph Glotzbach[1], Jonas Kley[2], Todd A. Ehlers[1]

[1]Department of Geosciences
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University of Tübingen, Germany

[2]Geoscience Centre
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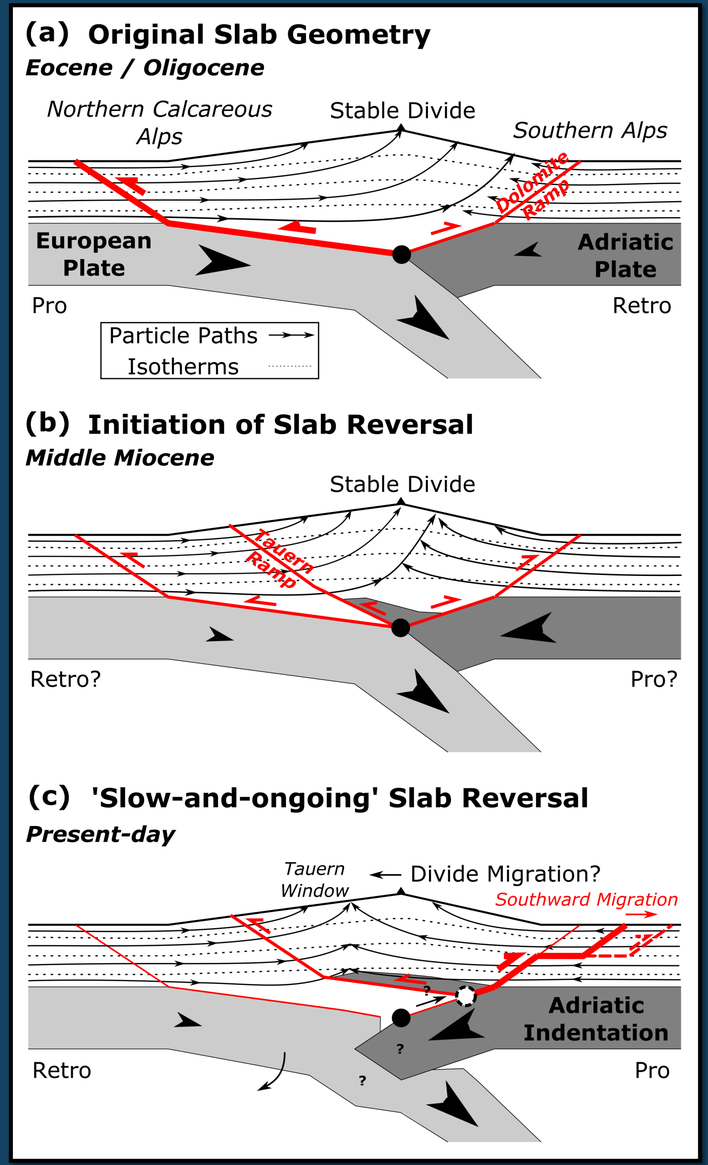
Hypothesis

Hypothesis tested

If continental subduction polarity reversal along TRANSALP took place, then this process must be reflected in the thermochronological record.

Observations if hypothesis is valid

- Rapid vs. slow growth of new pro- and retro-wedges, respectively
- Deep-seated exhumation in the new retro-wedge
- Divide migration towards new retro-wedge



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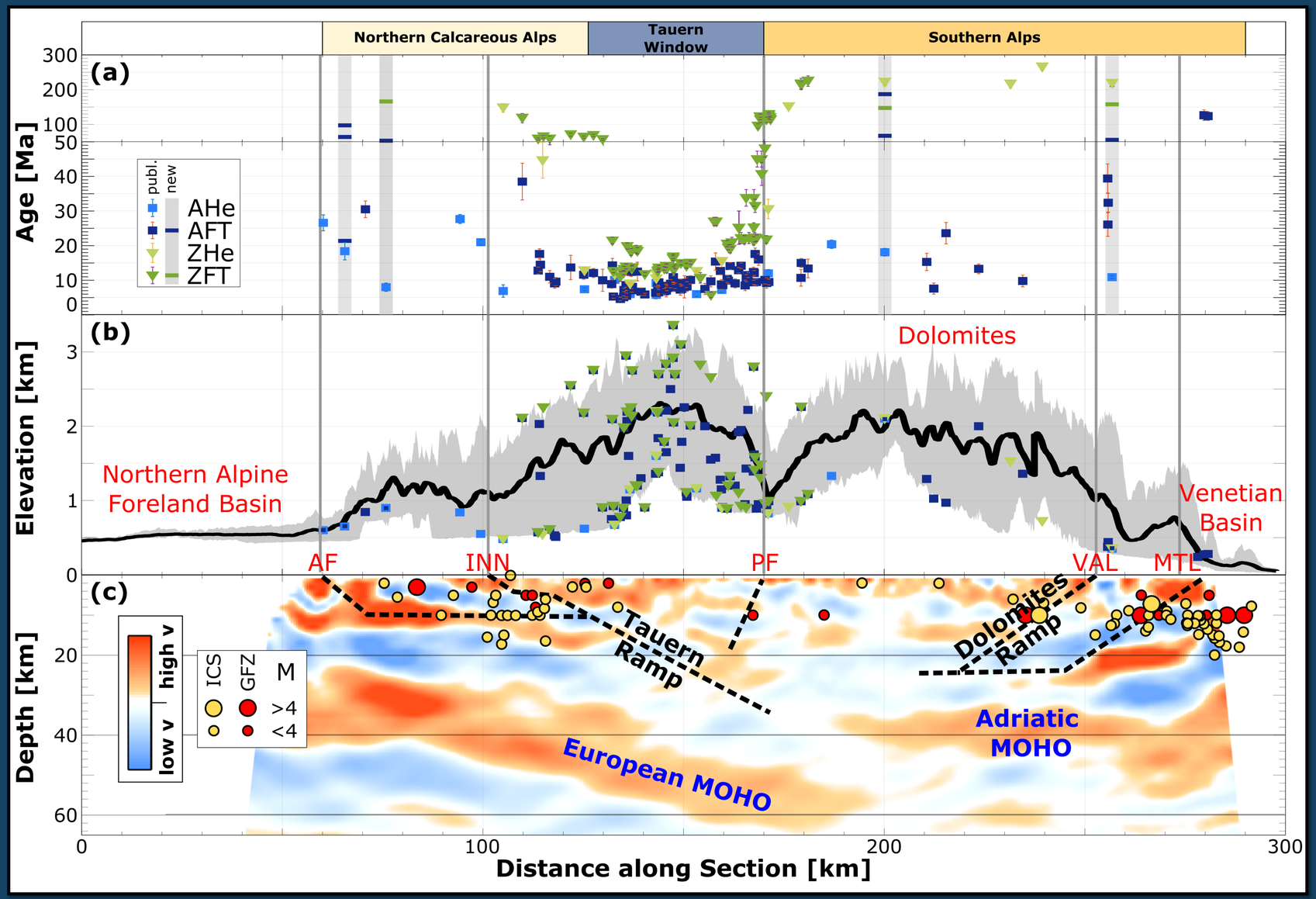
Crustal and Surface Record



- **Observation I:**
- **Observation II:**
- **Observation III:**
- **Observation IV:**

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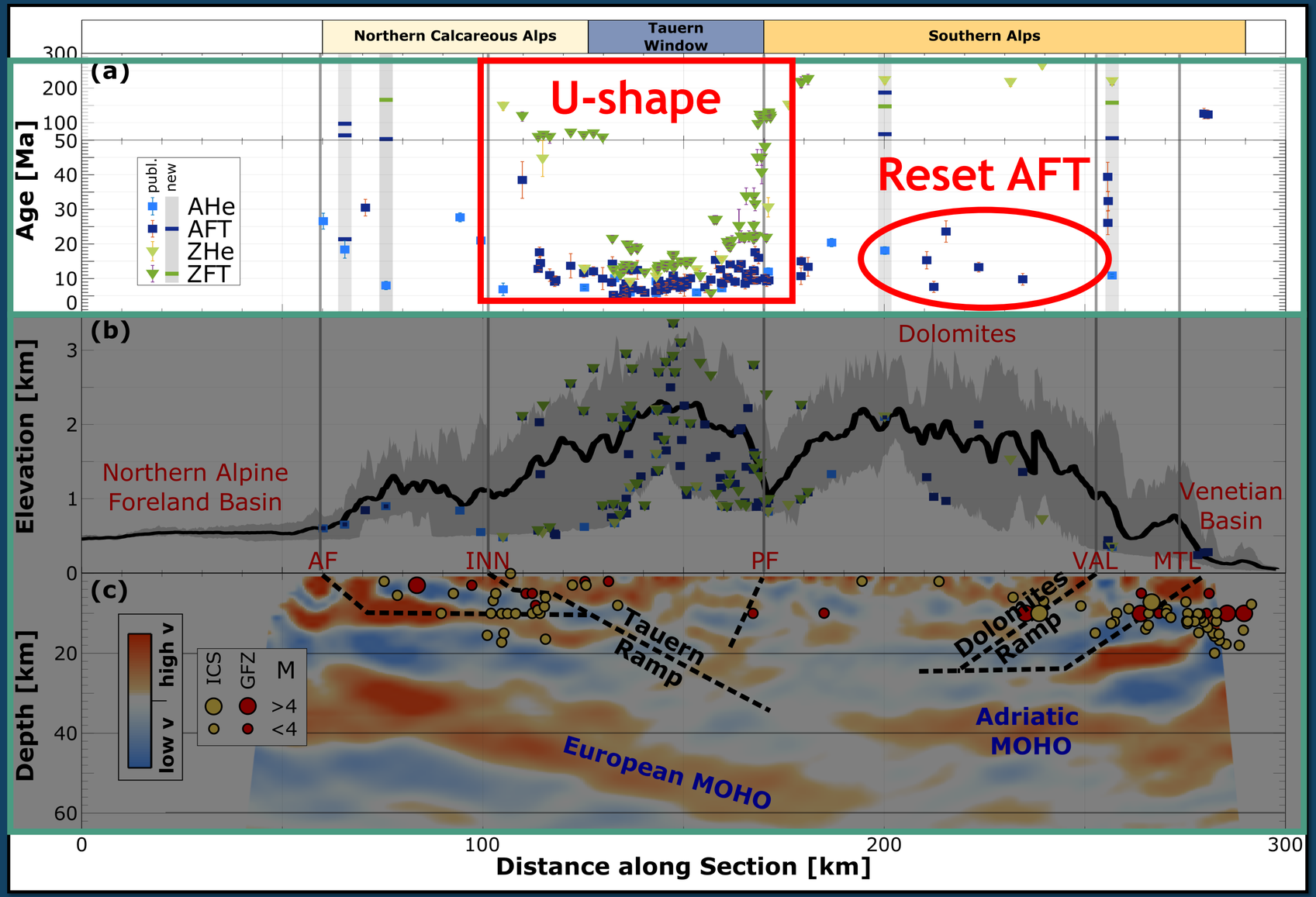
Thermochronological Record



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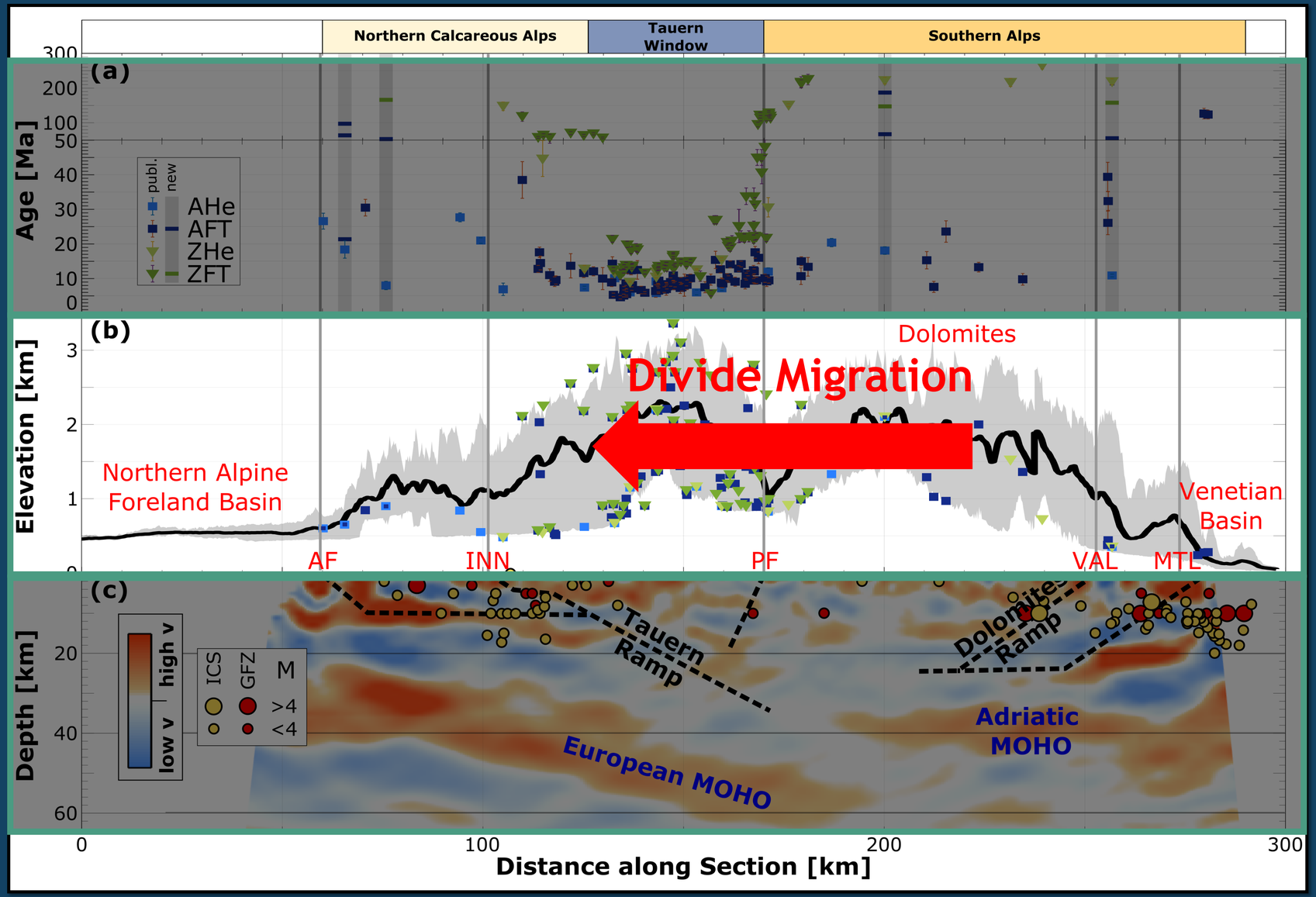
- **Observation I:**
  U-shape, reset ages above Tauern Window
- **Observation II:**
  Reset AFT ages in the Southern Alps
- **Observation III:**
- **Observation IV:**

Geomorphic Record



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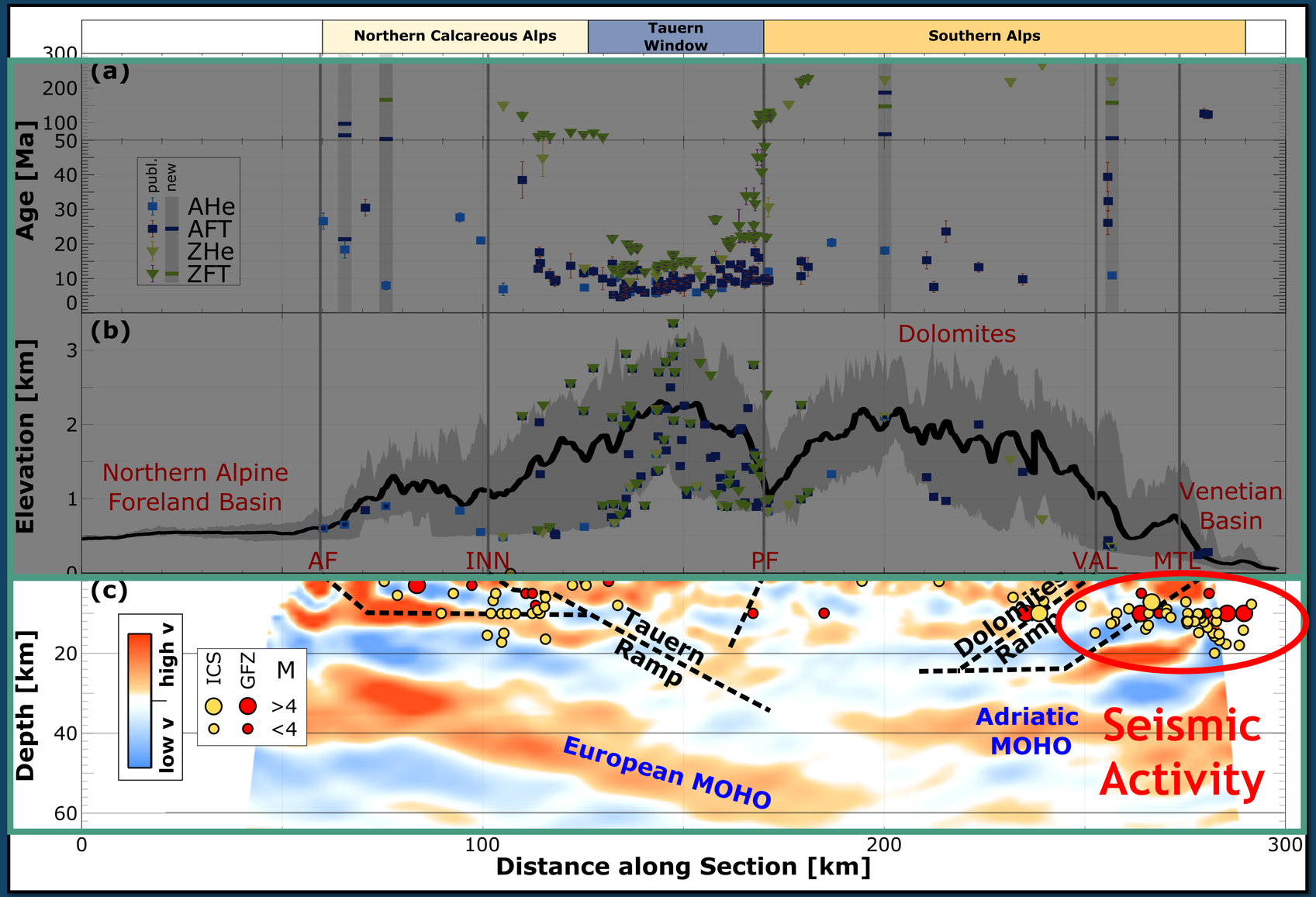
- **Observation I:**
  U-shape reset ages above Tauern Window
- **Observation II:**
  Reset AFT ages in the Southern Alps
- **Observation III:**
  Northward migration of drainage divides (Winterberg & Willett, 2019)
- **Observation IV:**

Seismic Record



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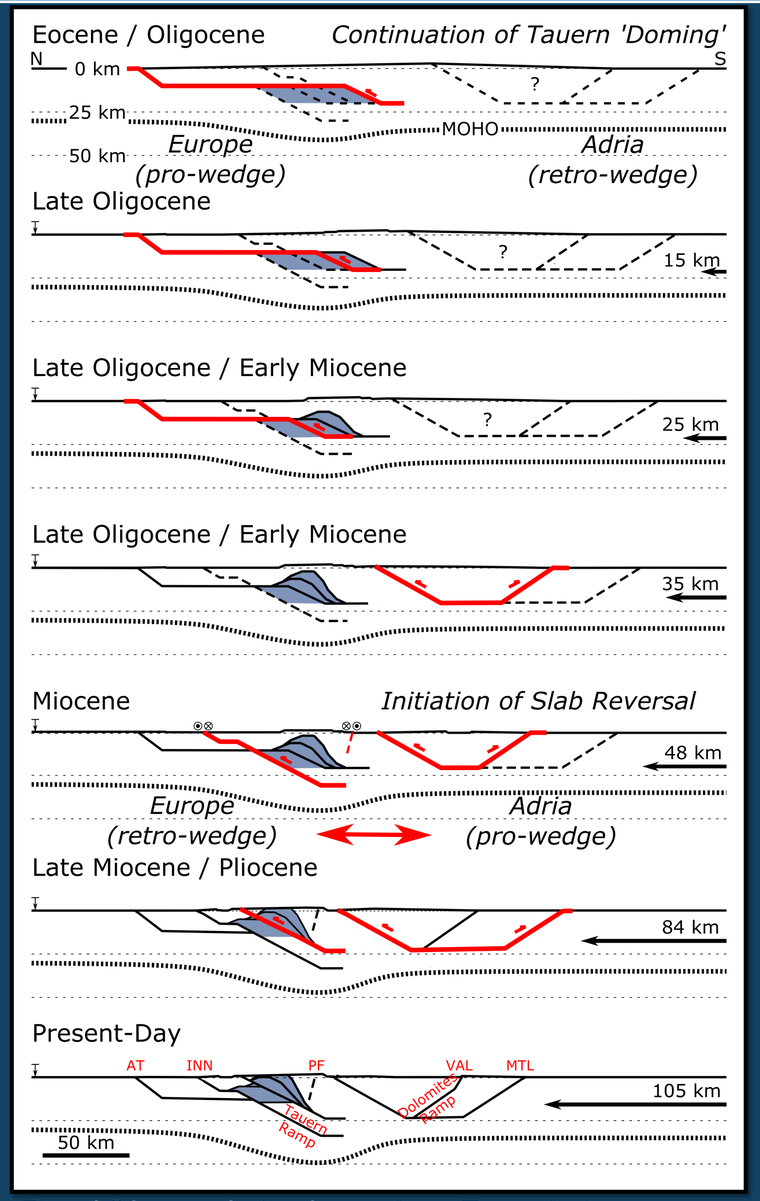
- **Observation I:**
  U-shape reset ages above Tauern Window
- **Observation II:**
  Reset AFT ages in the Southern Alps
- **Observation III:**
  Northward migration of drainage divides (Winterberg & Willett, 2019)
- **Observation IV:**
  Seismic activity in the Venetian Basin

Structural-kinematic Model

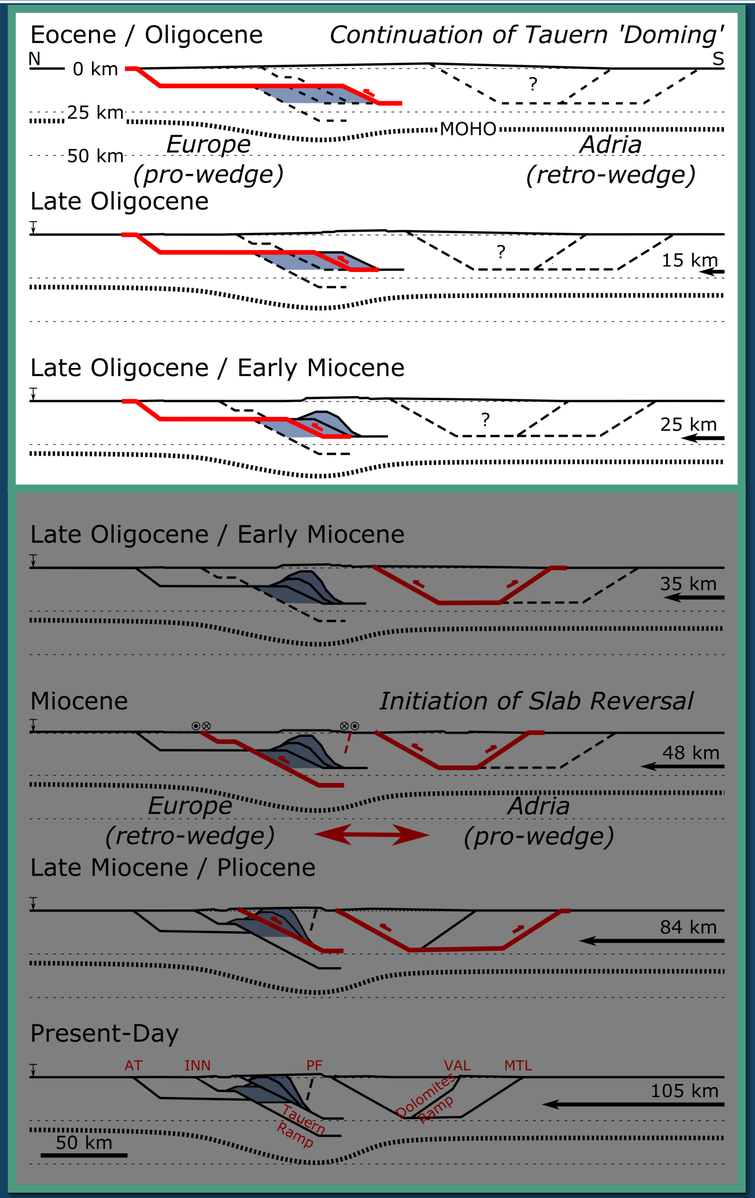
- **Tectonic Event I:**
- **Tectonic Event II:**
- **Tectonic Event IV:**



Eizenhöfer et al. (under review; Tectonics)

Structural-kinematic Model

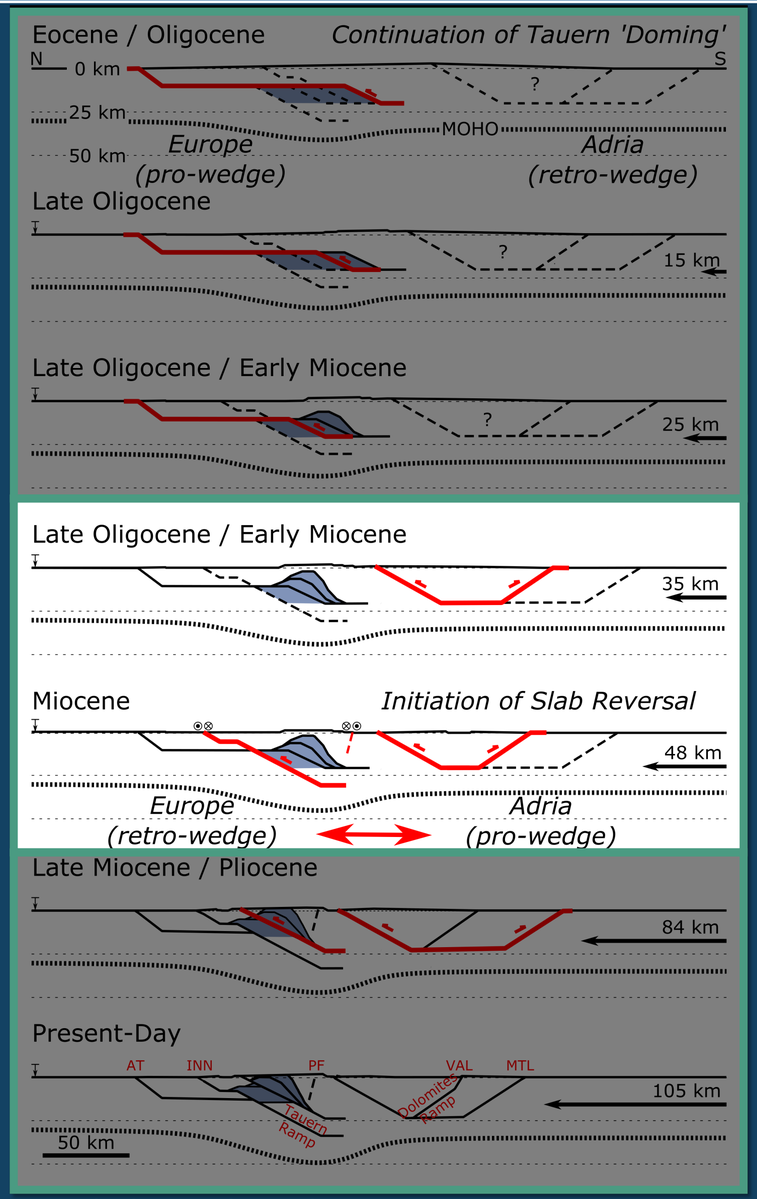
- **Tectonic Event I:**
  Tauern Doming
- **Tectonic Event II:**
- **Tectonic Event IV:**



Eizenhöfer et al. (under review; Tectonics)

Structural-kinematic Model

- **Tectonic Event I:**
  Tauern Doming
- **Tectonic Event II:**
  Active Tauern Ramp and southwards shift of active deformation
- **Tectonic Event IV:**



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Structural-kinematic Model

- **Tectonic Event I:**
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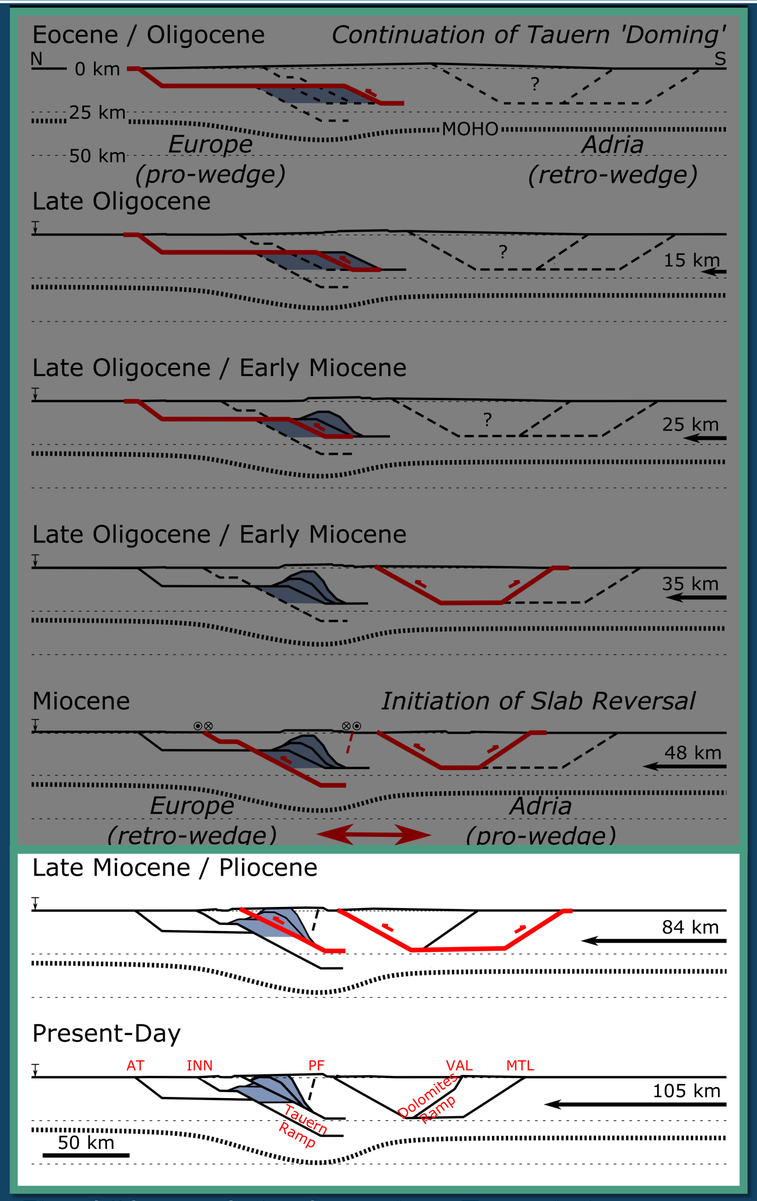
- **Tectonic Event II:**
  Active Tauern Ramp and southwards shift of active deformation
- **Tectonic Event IV:**
  Southward growth of orogenic wedge



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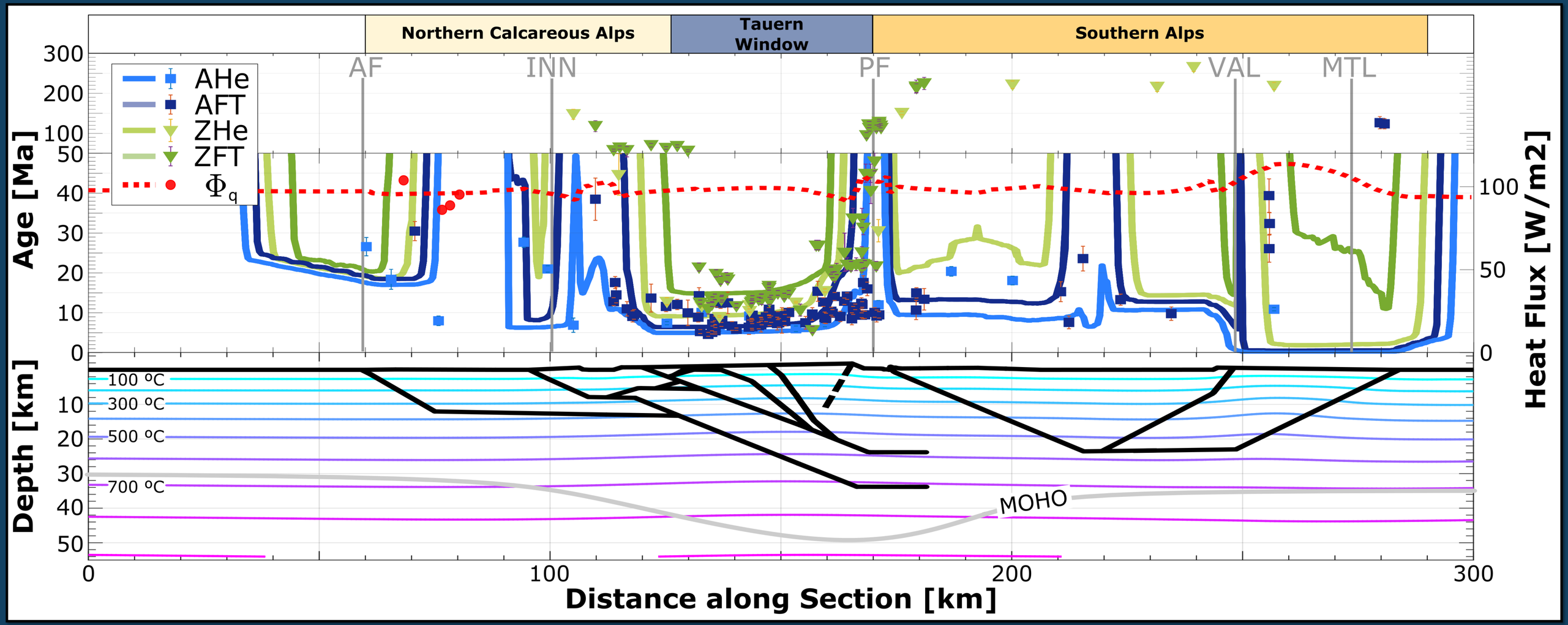
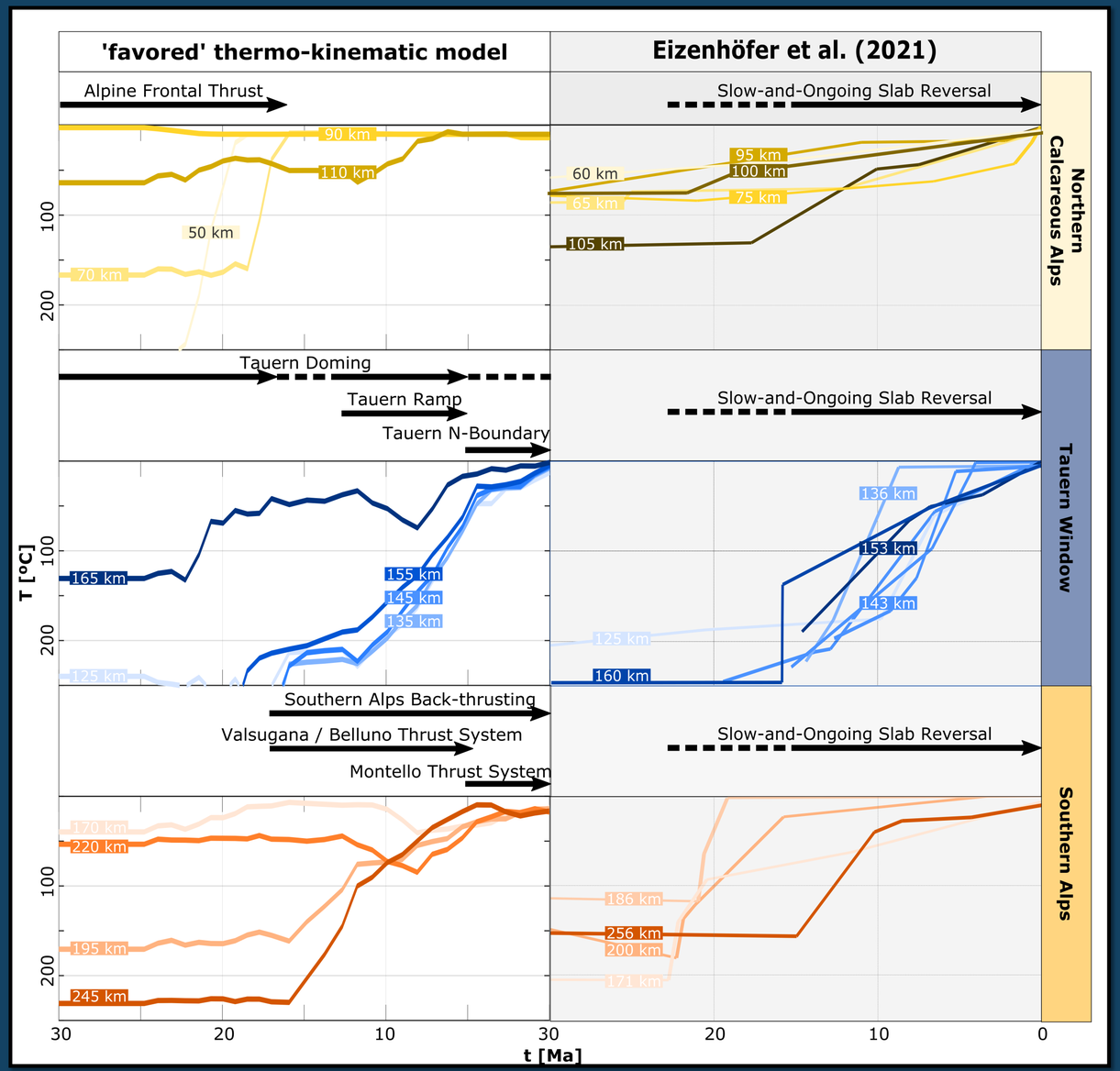
Thermal Model and Cooling Age Prediction



Eizenhöfer et al. (under review; Tectonics)

Proposed structural-kinematic evolution consistent with thermal record.

Thermal Model and t-T-path Prediction



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Forward modelled t-T-paths consistent with t-T-paths from thermal inversion modelling

Hypothesis

Hypothesis tested

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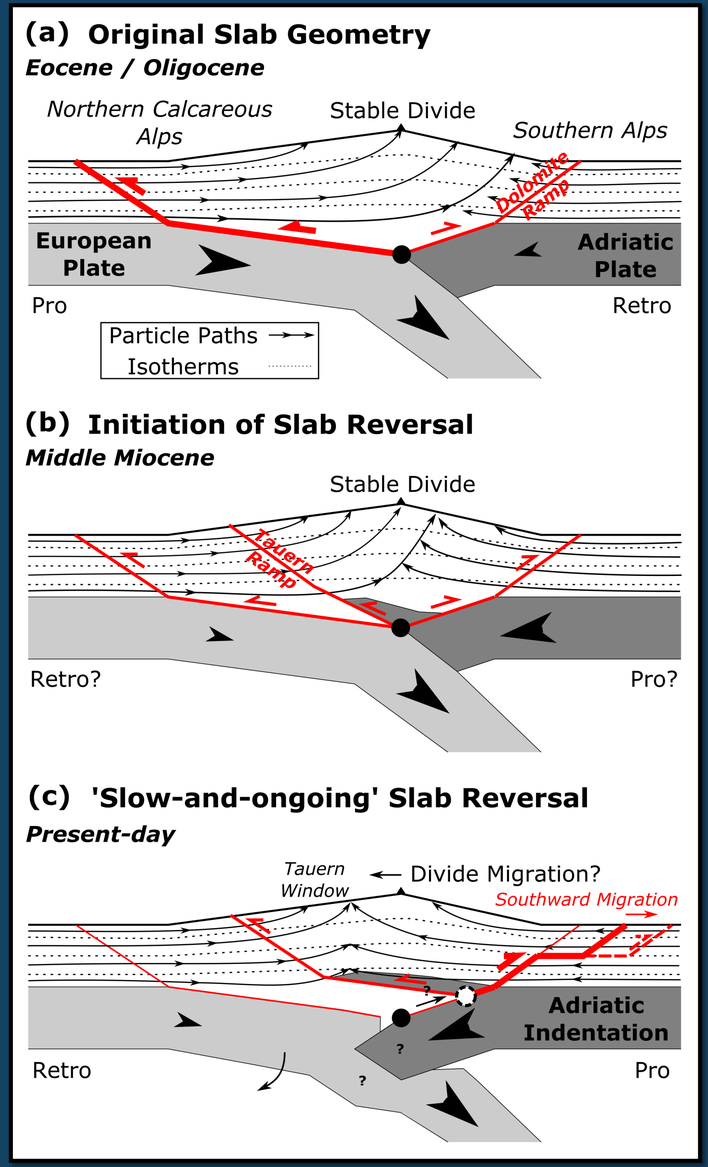

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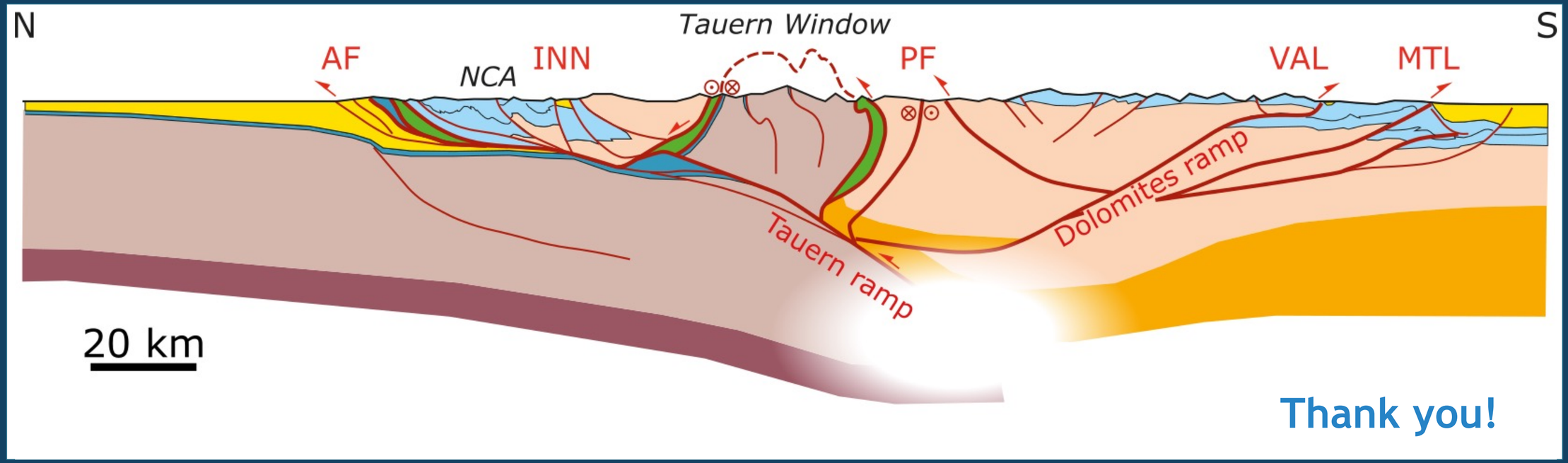

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