Source area and emplacement conditions of Riscos Bayos Ignimbrites, Caviahue-Copahue Volcanic Complex (Argentina)

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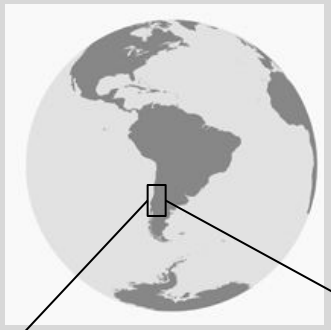
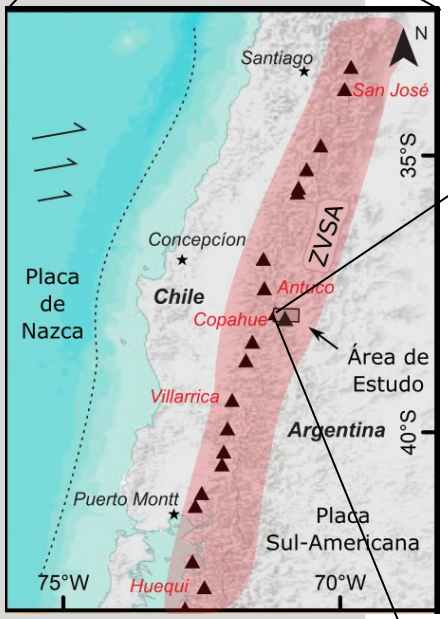
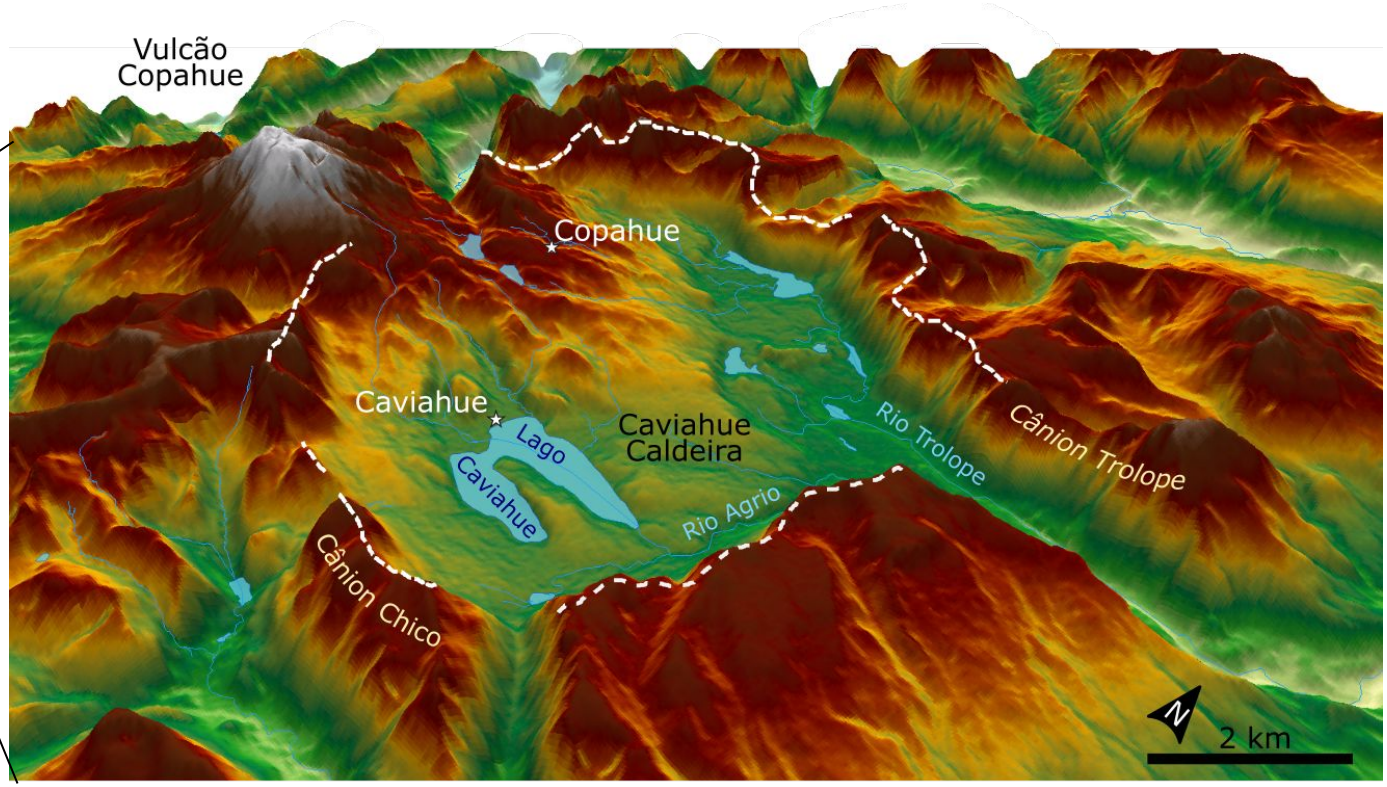
Introduction

- Located in the southern Andes, the CCVC is one of the most active volcanic centers.
- Composite volcano (**Copahue**) + caldera (?) (**Caviahue**).





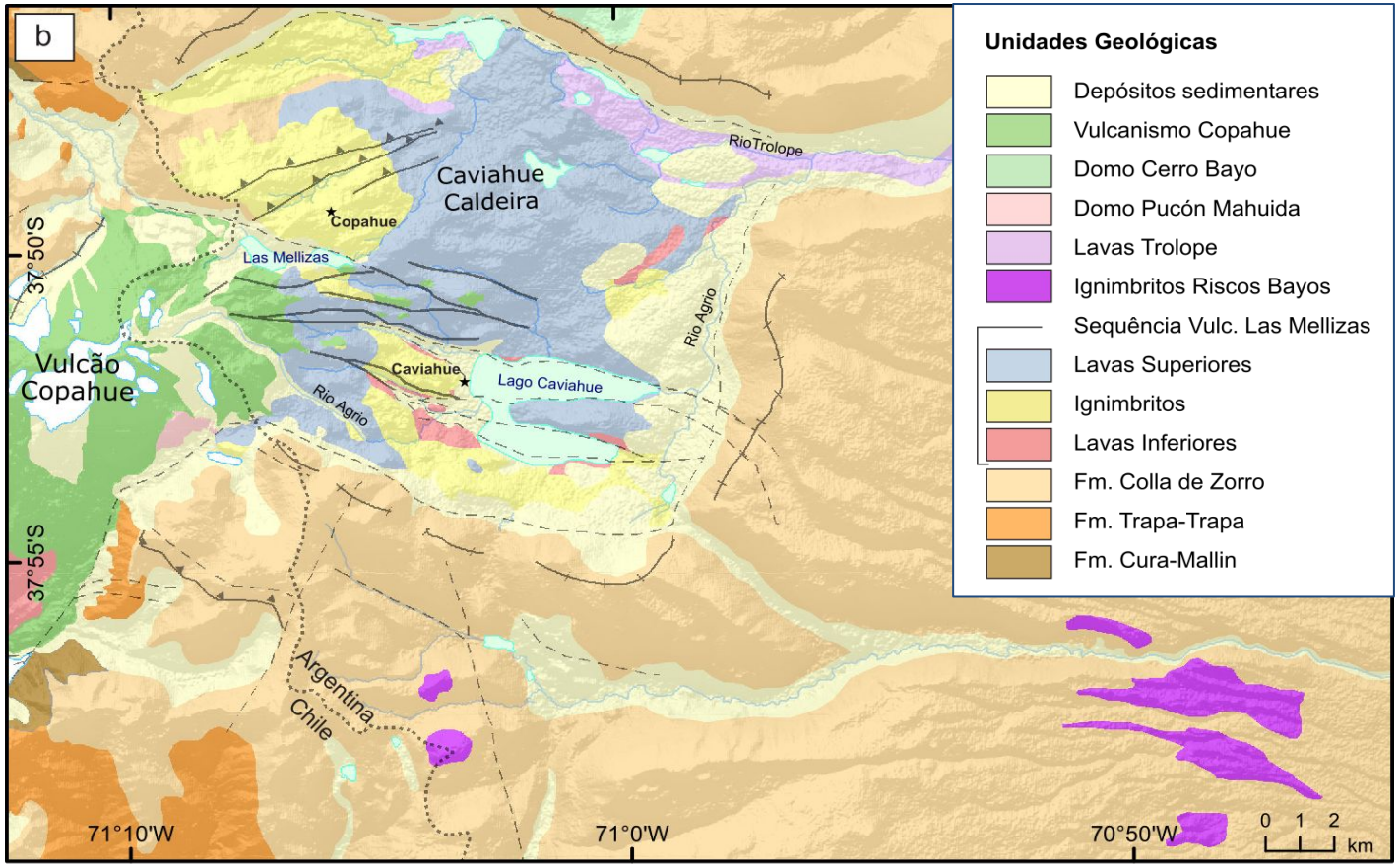


Legenda: ☆ Cidade Lago Rio Elevação 900 m 1500 m 3000 m

Haag (2019).

Geological setting

- Lavas and ignimbrites younger than 6 Ma.
- Caviahue may be associated with a volcanic caldera.

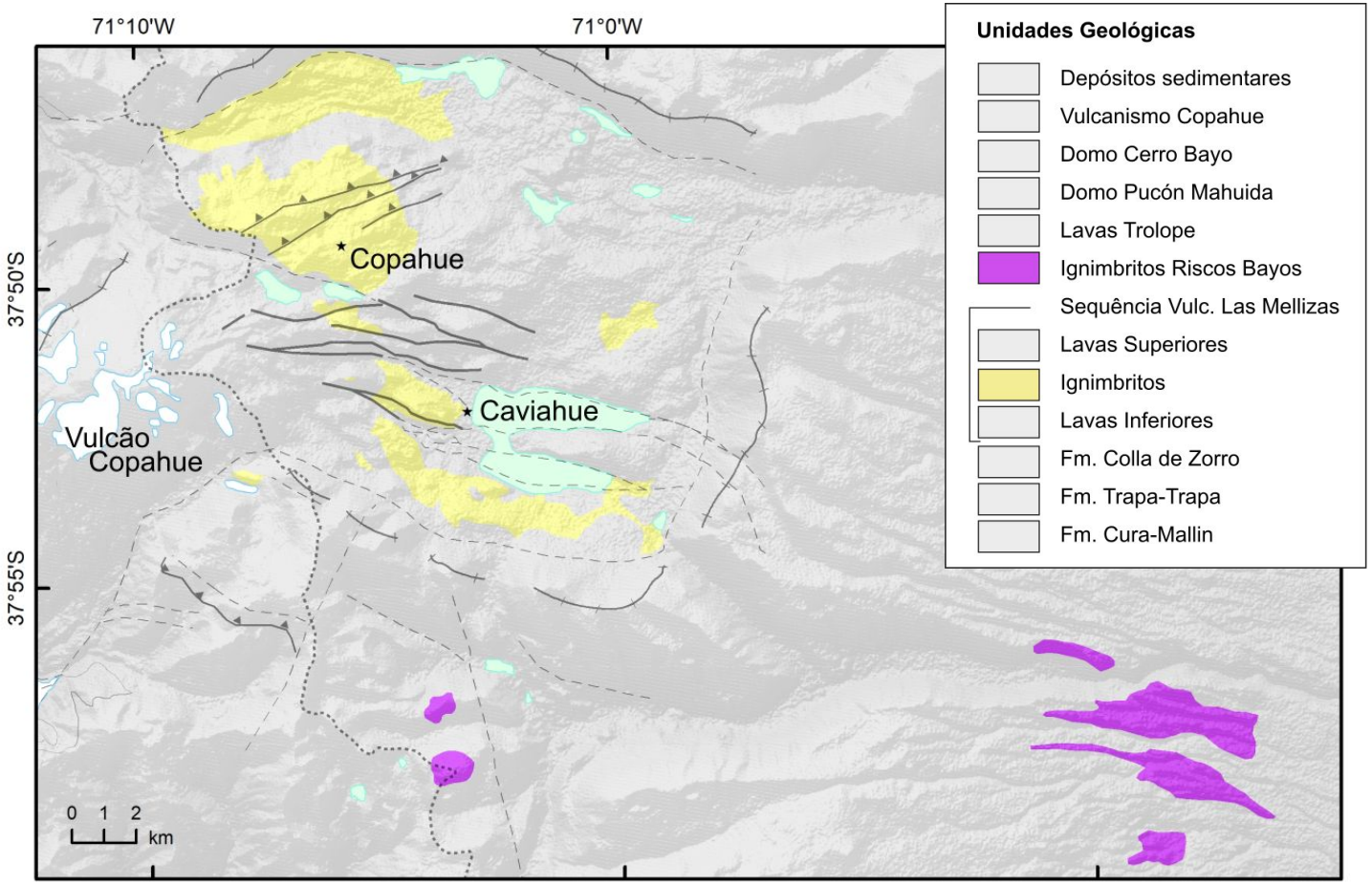


Pesce (1989).

Map modified from Melnick *et al.* (2006).

Geological setting

- Several ignimbrite deposits, two main units
- Caviahue may be associated with a volcanic caldera.



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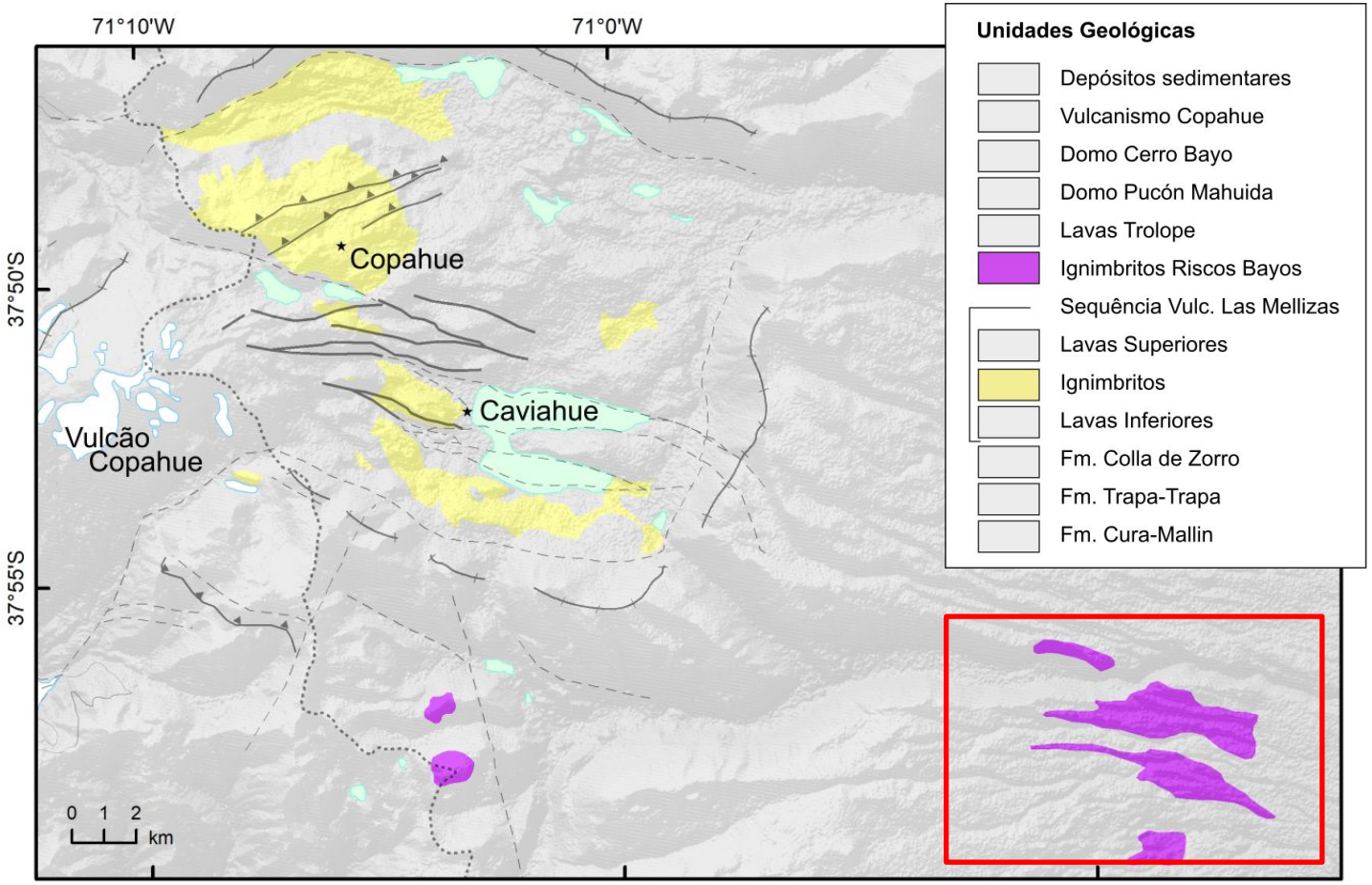

Pesce (1989).

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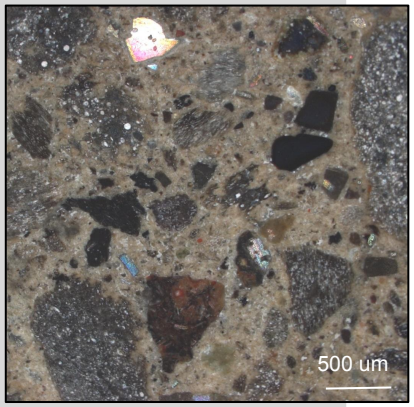
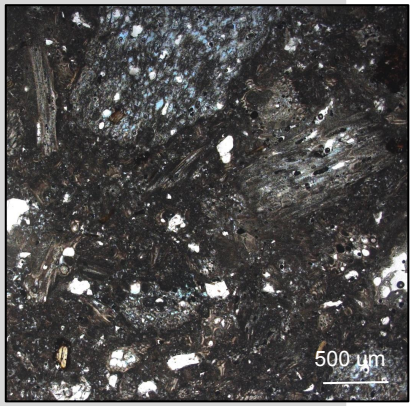
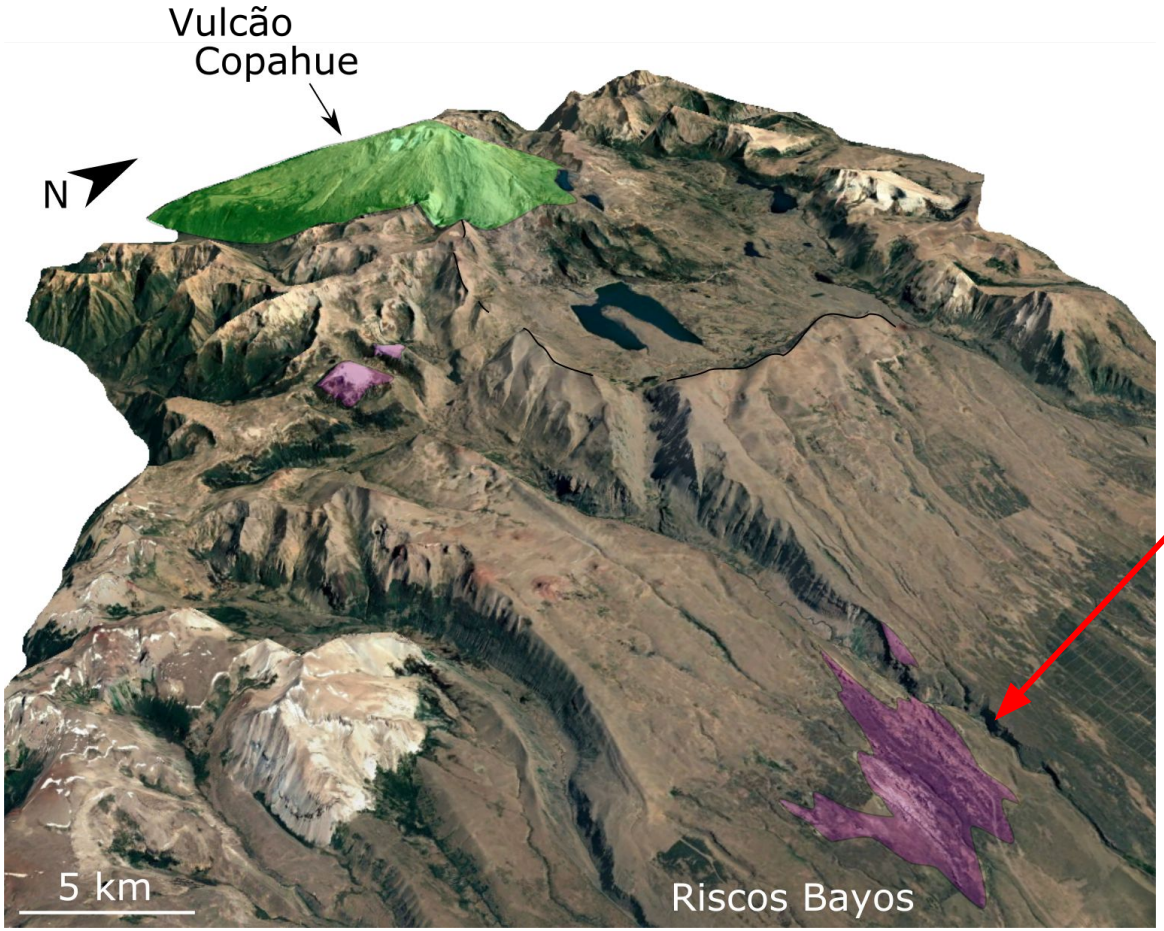
Riscos Bayos Ignimbrite

- Located 15 km SE of Caviahue depression.
- Non-welded ignimbrite sequence.



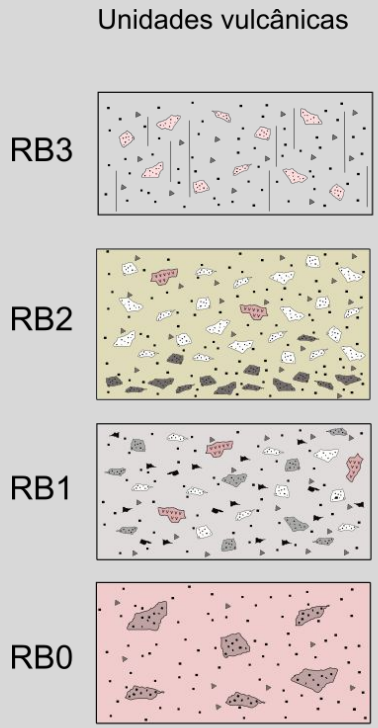




Haag (2019).

Field aspects

- Composed of 4 flow units (RB0-RB3).
- Sampled RB1, RB2, and RB3.



General outcrop

RB3

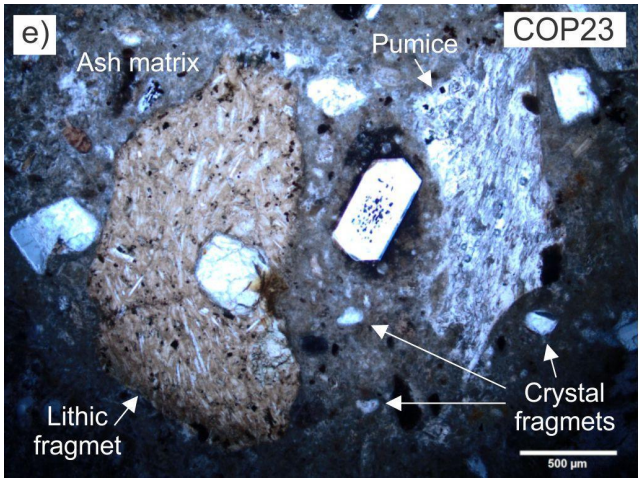
RB2

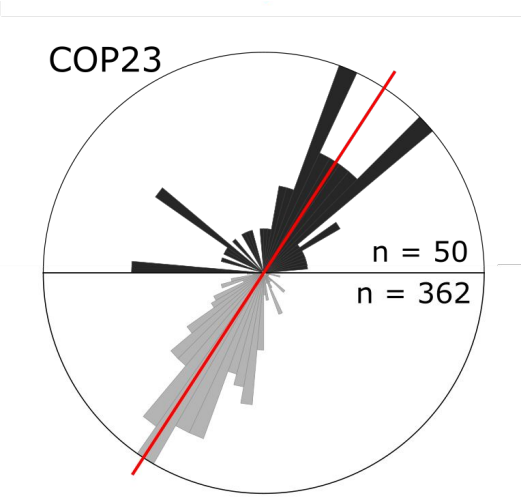
RB1

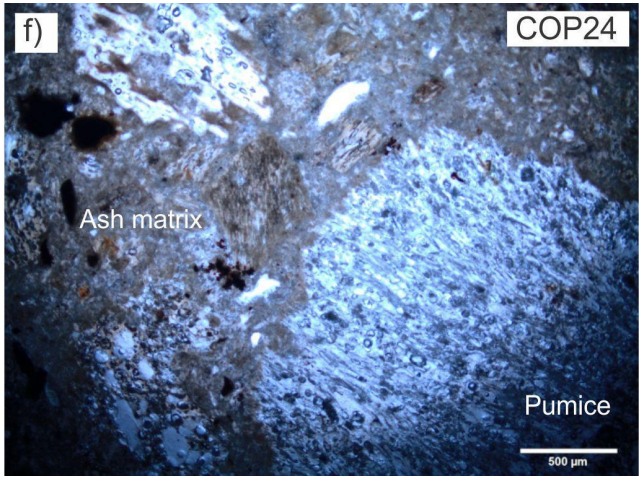
Haag (2019).

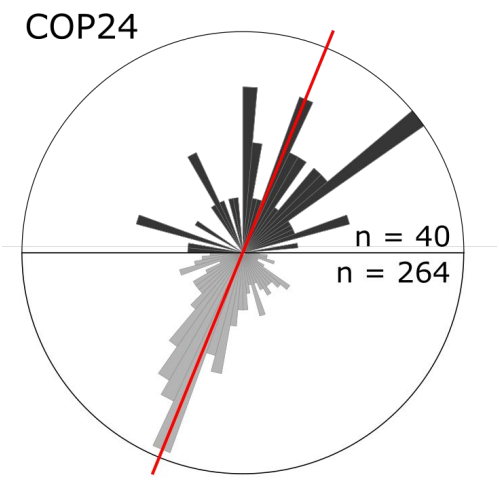
Petrography

- Major axis measurements of silicate and oxide fabrics using ImageJ indicate consistent shear regime.







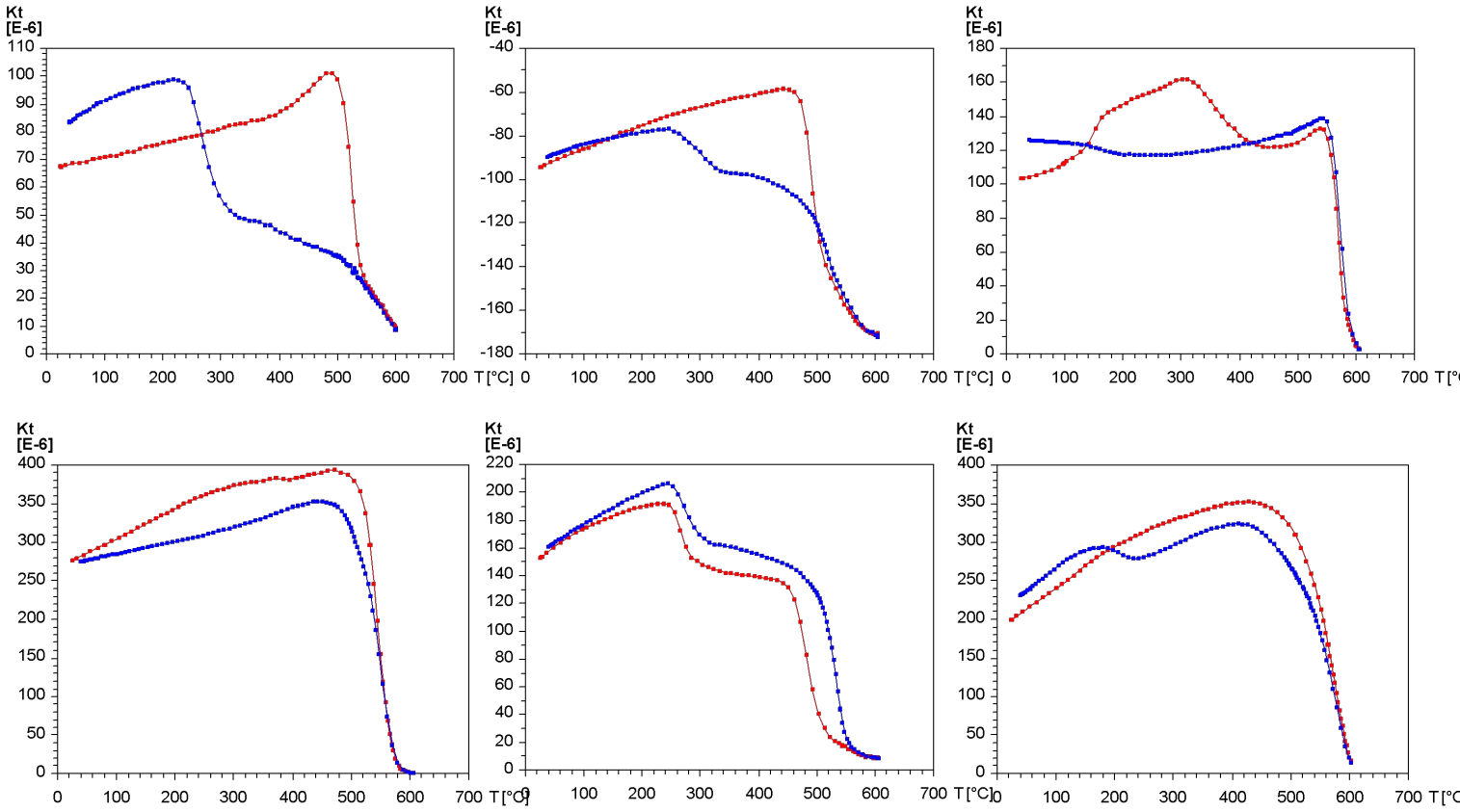


Haag (2019).

Monchinatto et al (2020).

High-T curves

- Both **reversible** and **irreversible** behaviours.
- Tc compatible with magnetite (580 °C).



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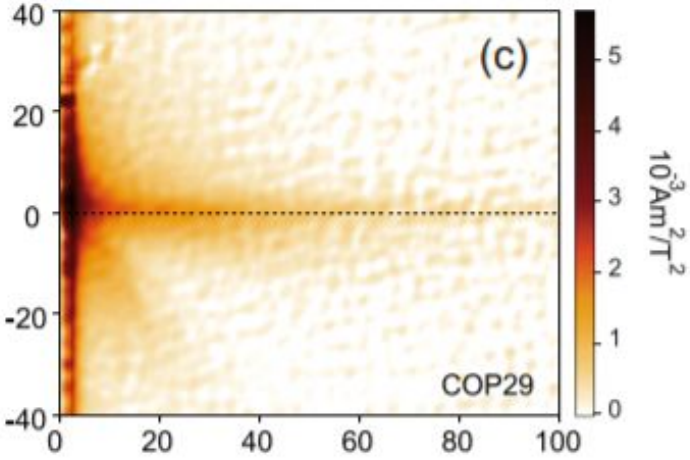
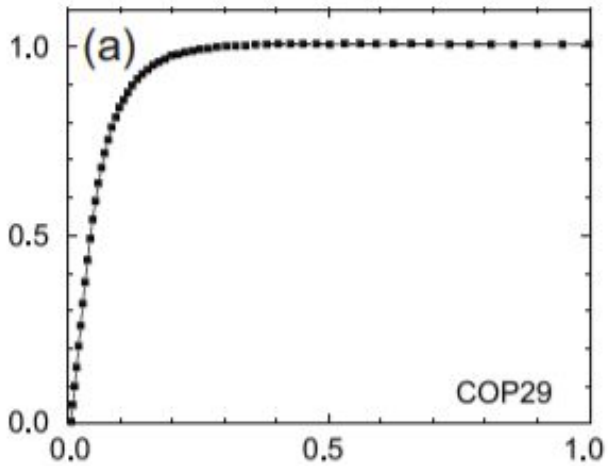
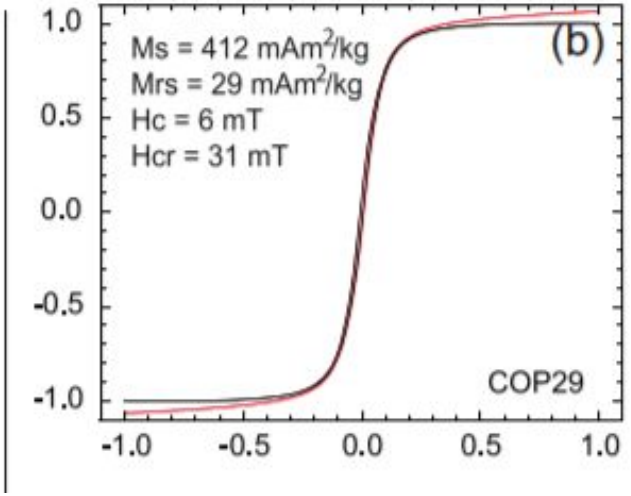
IRM, Hysteresis and FORC diagrams

- Low Ms and Hcr (compatible with magnetite).
- Both MD and SD states.



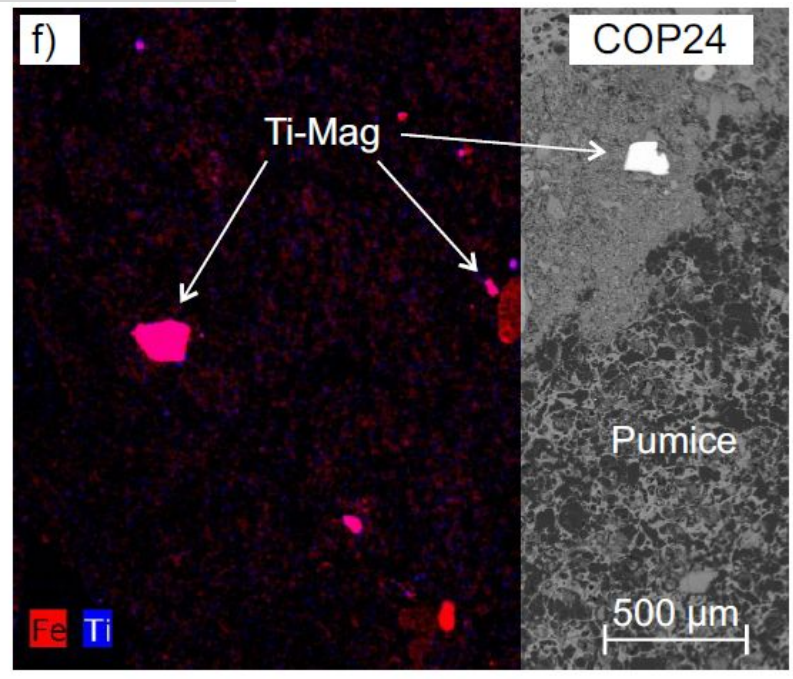




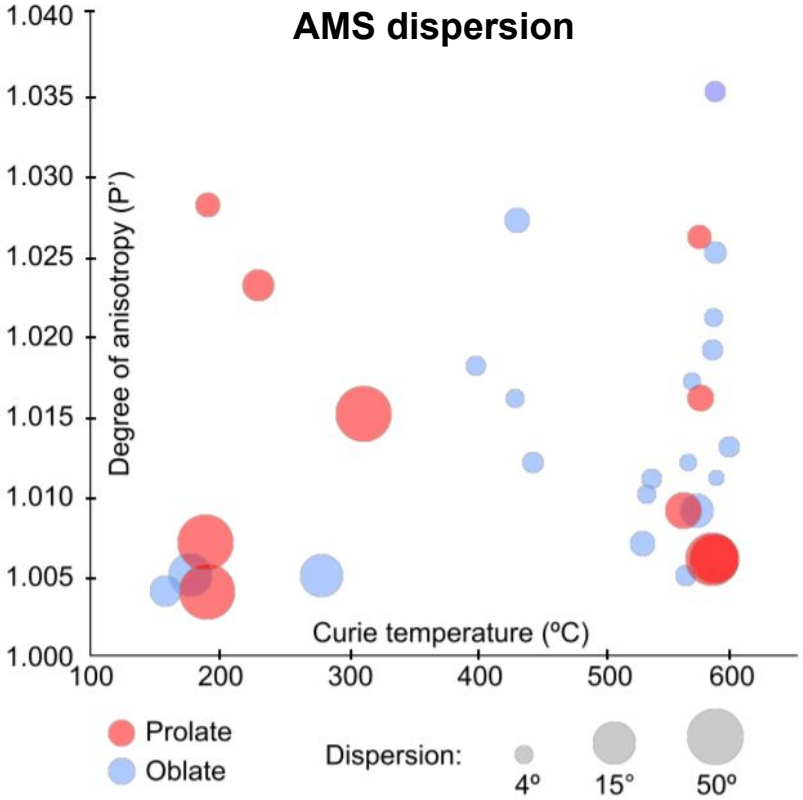
Monchinatto et al (2020).

SEM observations

- *Primary* (high Tc) to *secondary* (low Tc) Ti-Magnetite crystals.
- AMS dispersion ∝ Tc, P` and Ti content.



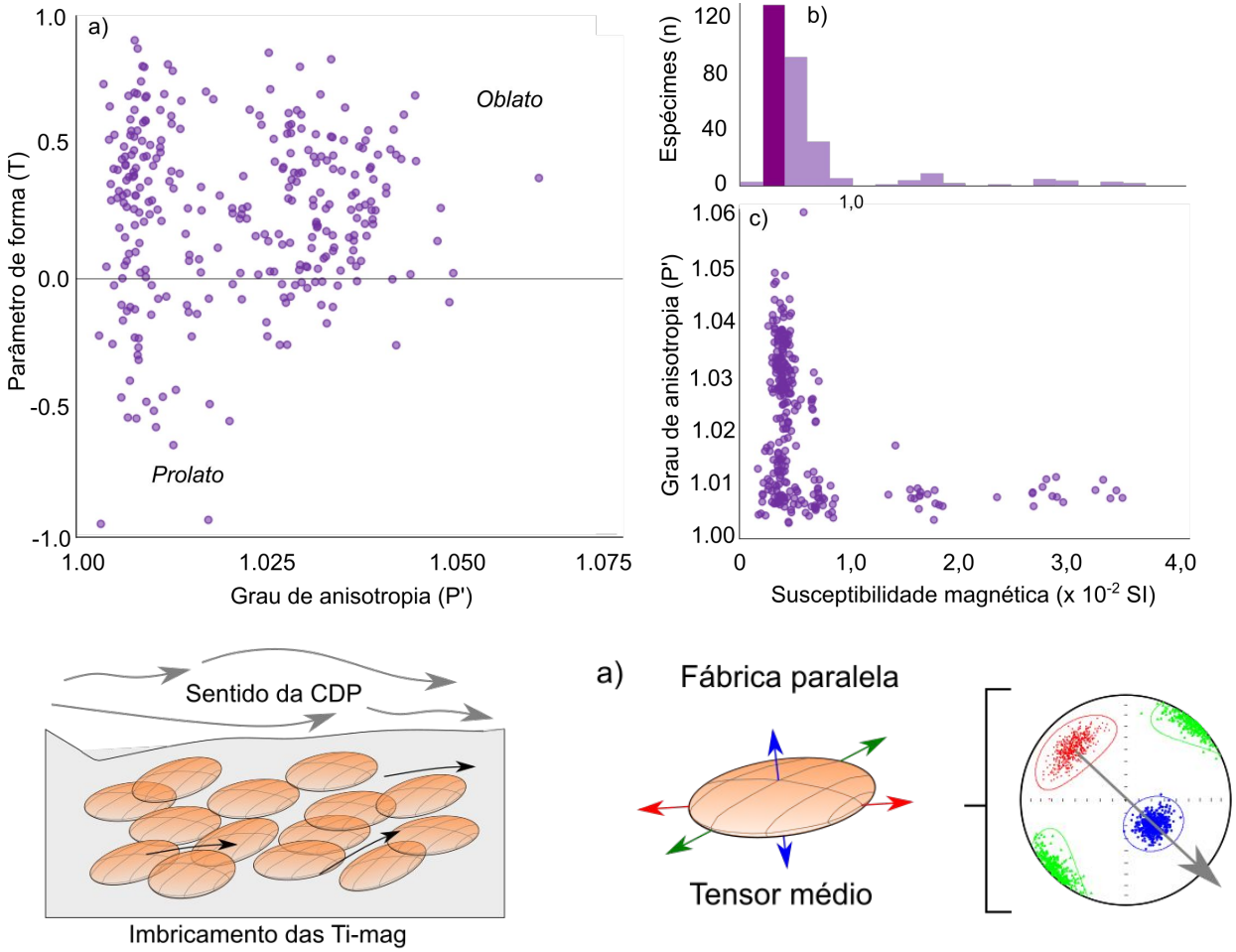
EDS mapping



Monchinatto et al (2020).

Low-field AMS scalar results

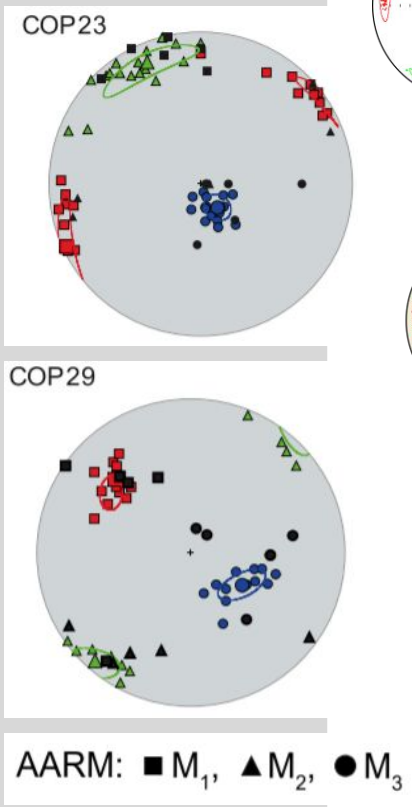
- Mostly oblate to triaxial, low Kmean and degree of anisotropy results.

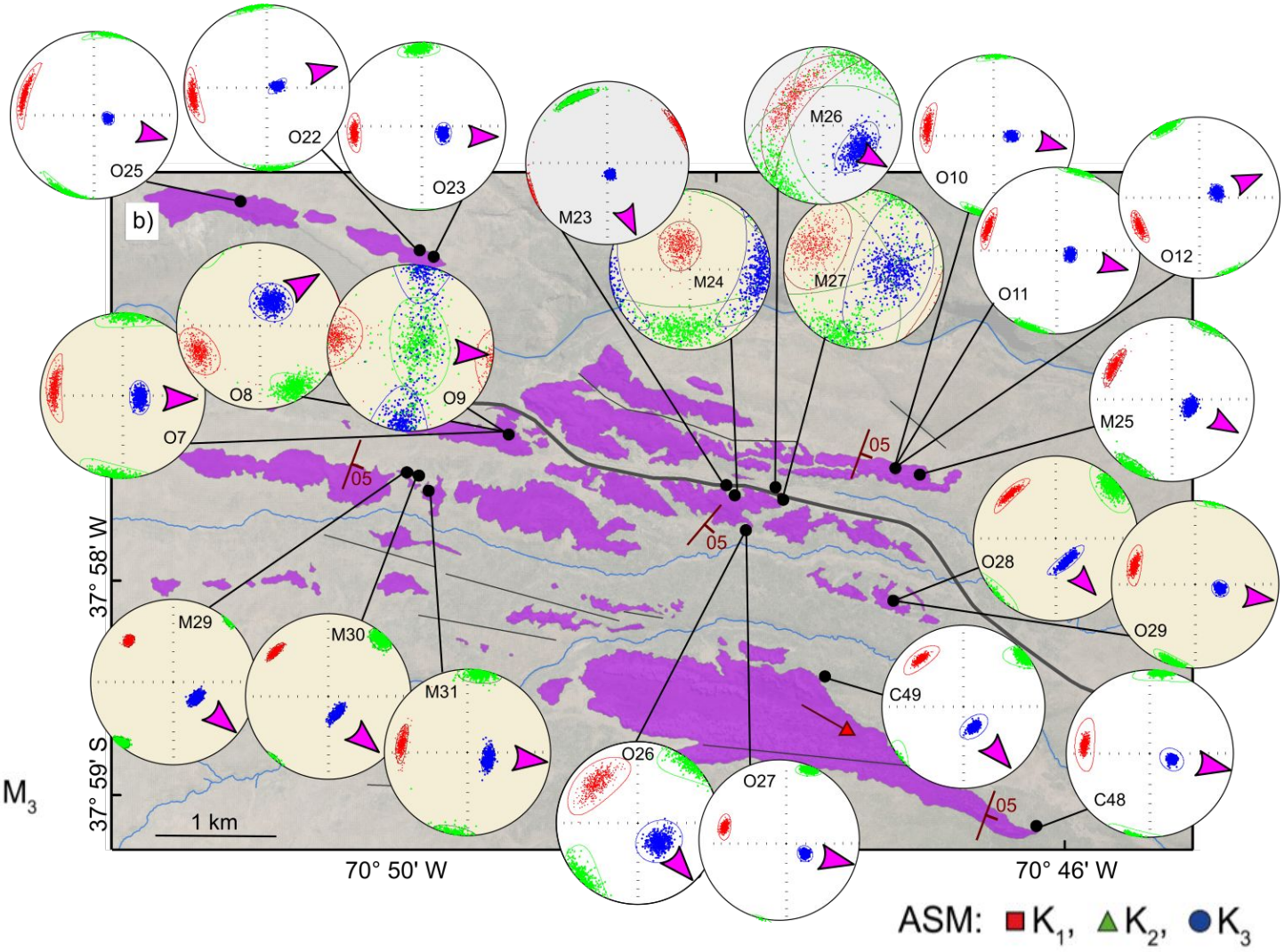


Haag (2019).

Directional AMS and AARM results

- Agreement in most measurements, flow sense to SE.



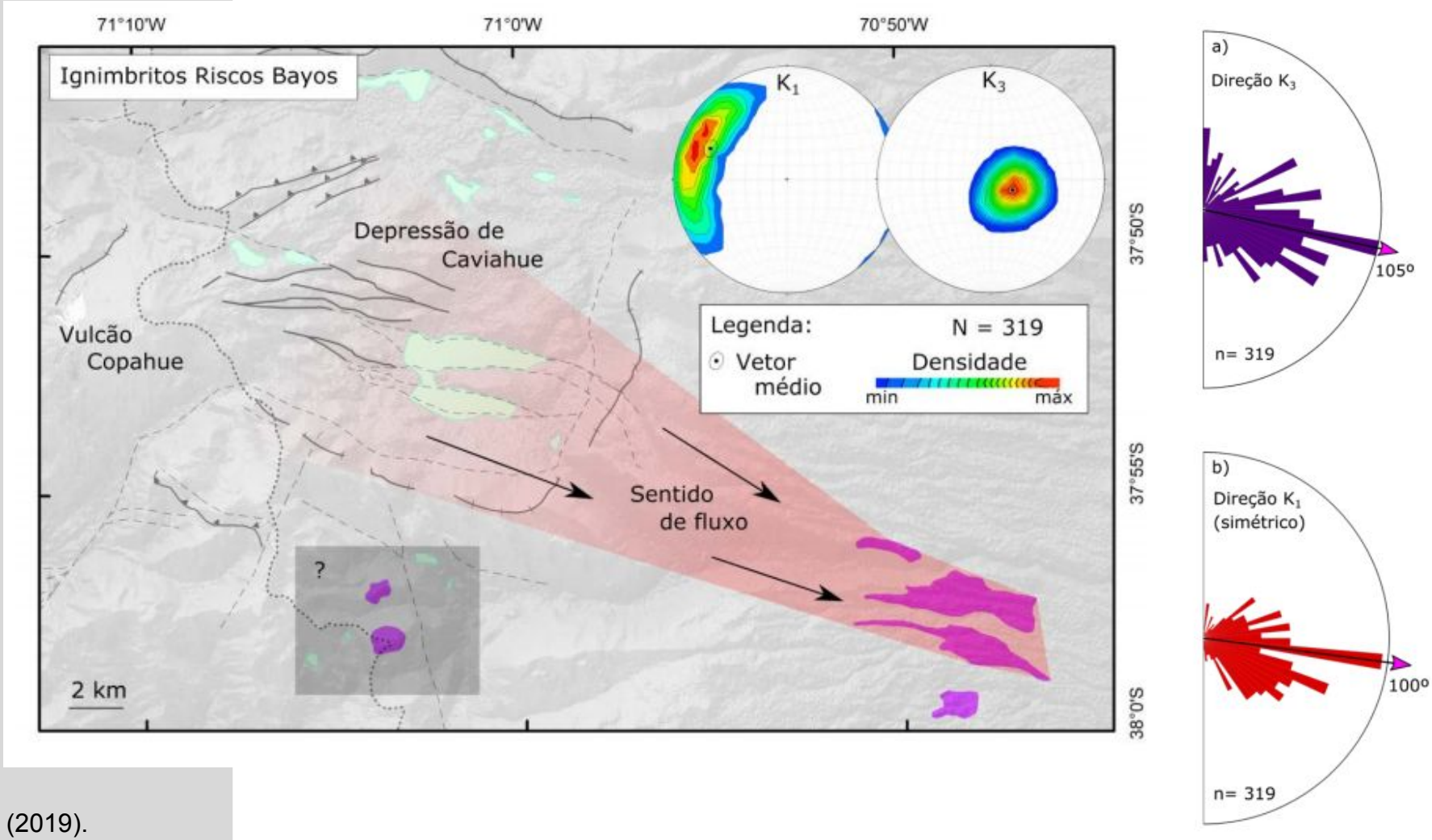


Ort et al (2014)

Haag (2019).

Directional results

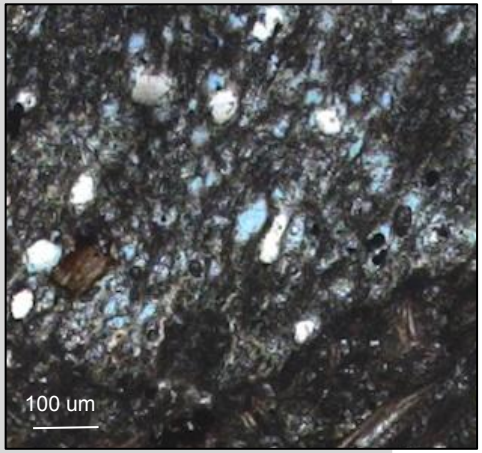
- Source area - southern Caviahue depression



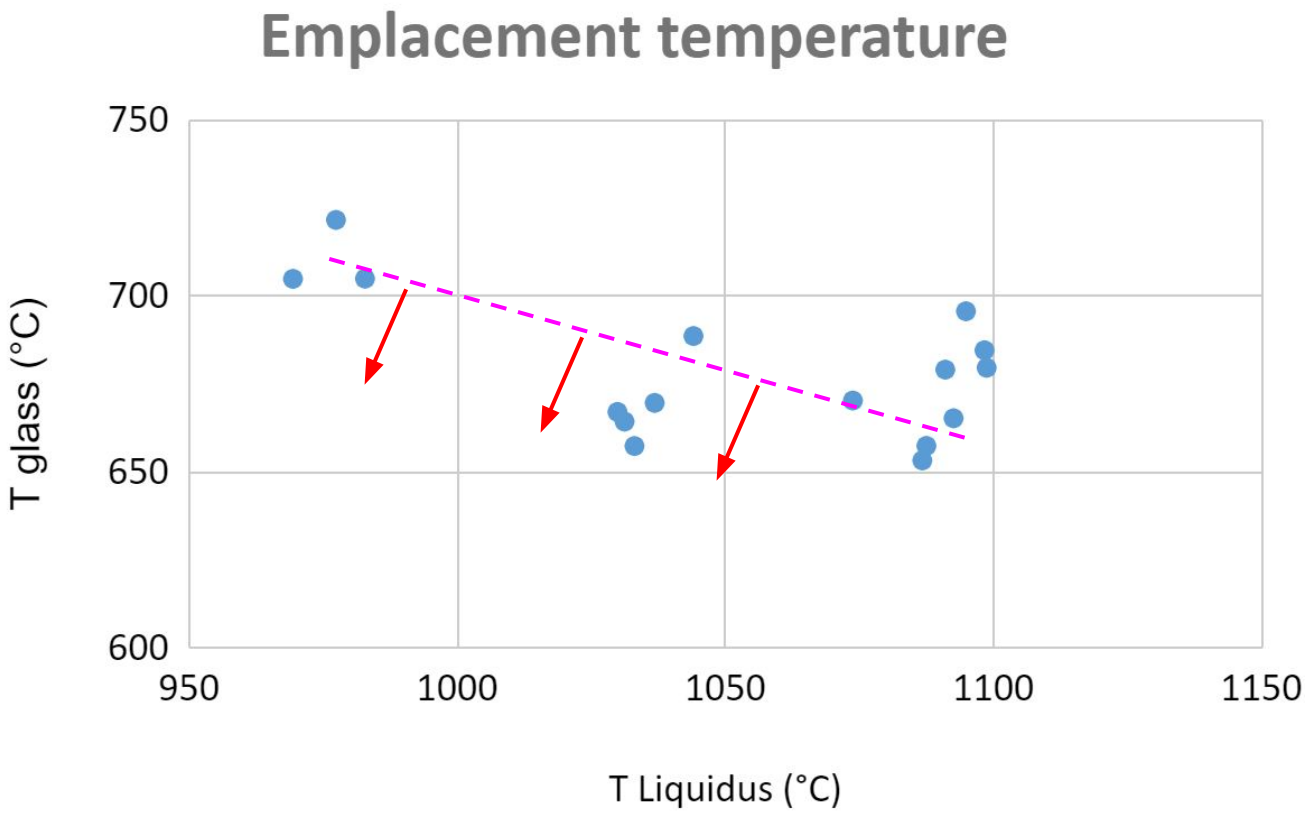
Haag (2019).

Emplacement

- **Emplacement** conditions - temperature and rheology
- T emplacement < 700° C



Porous glass

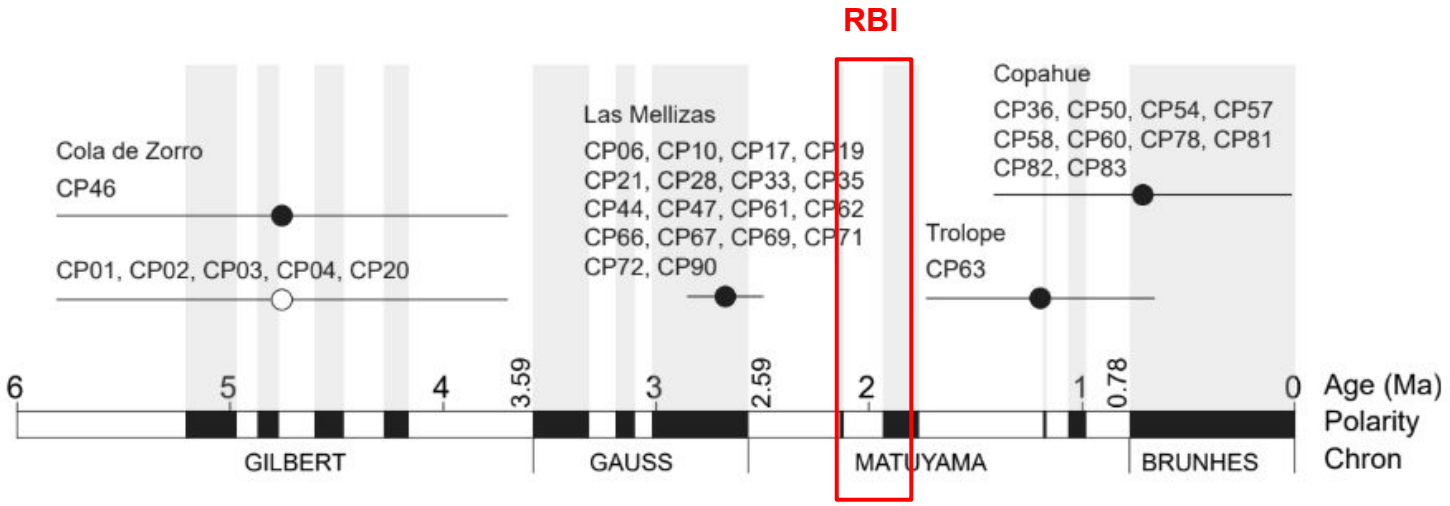


Rheology estimations using the model of Giordano et al (2005)

Future research

- **Paleomagnetic** data - stratigraphy (2 Ma)
- Paleointensity data

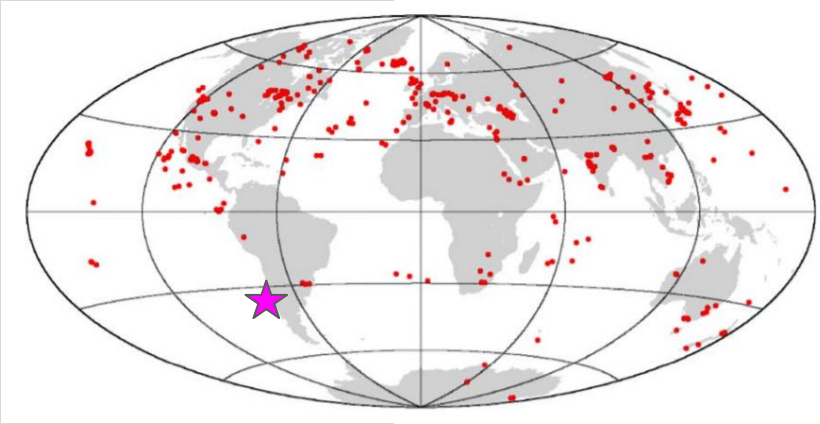
Paleosecular Variation from Northern Patagonia recorded by 0-5 Ma Caviahue-Copahue lava flows



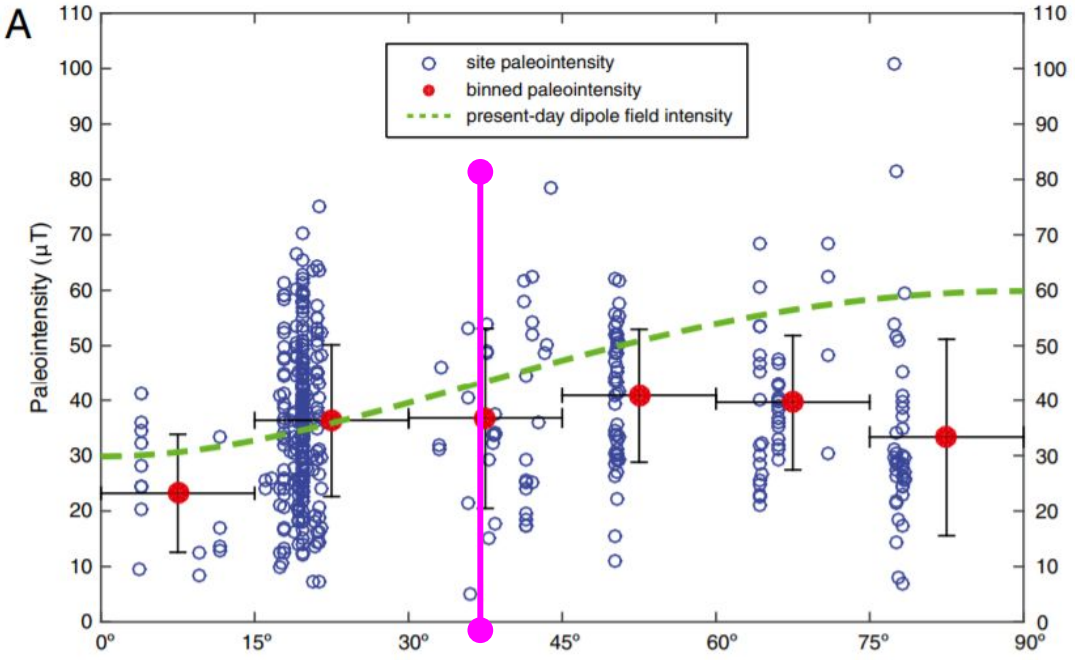
Monchinatto et al, *in prep* (2021).

Future research

- Paleomagnetic data - stratigraphy (2 Ma)
- **Paleointensity** data - South American database



Perrin and Schnepp (2004)



Wang et al (2015)

Thank you!

Copahue volcano eruption, 2016