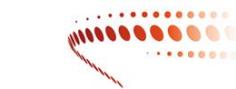




<http://doi.org/10.54499/ERA-MIN/0002/2019>  
<https://mostmeg.rd.ciencias.ulisboa.pt/>



ERA-MIN 2

RESEARCH & INNOVATION PROGRAMME ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY

ERA-MIN Joint Call 2019 (EU Horizon 2020 ERA-NET Co-fund Project ERA-MIN2, Grant agreement Nº 730238)

FCT

Fundaçao para a Ciéncia e a Tecnologia  
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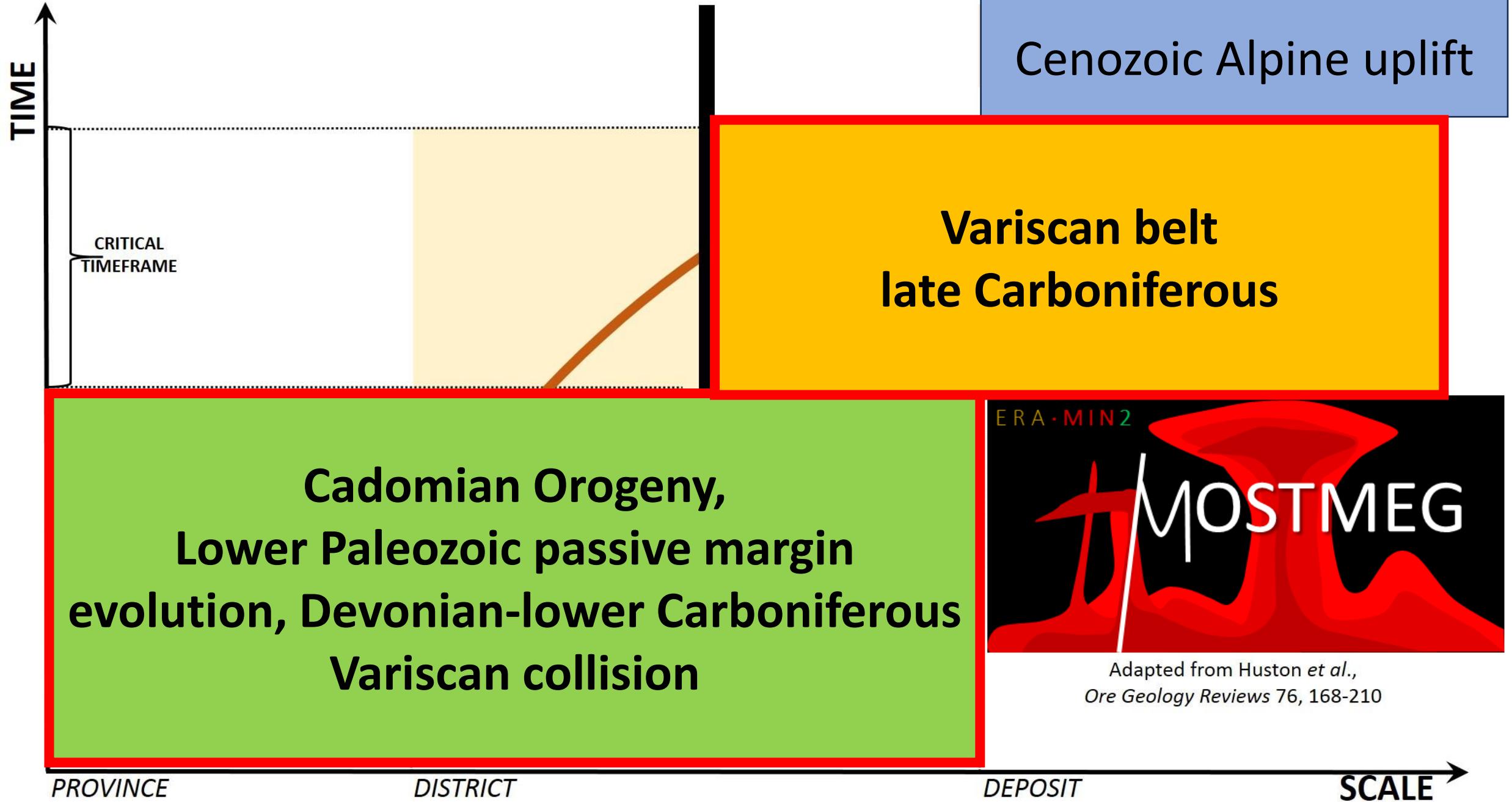


GEOCIÊNCIAS  
USP

# Structures and tectonic evolution of the Góis-Panasqueira-Segura strip

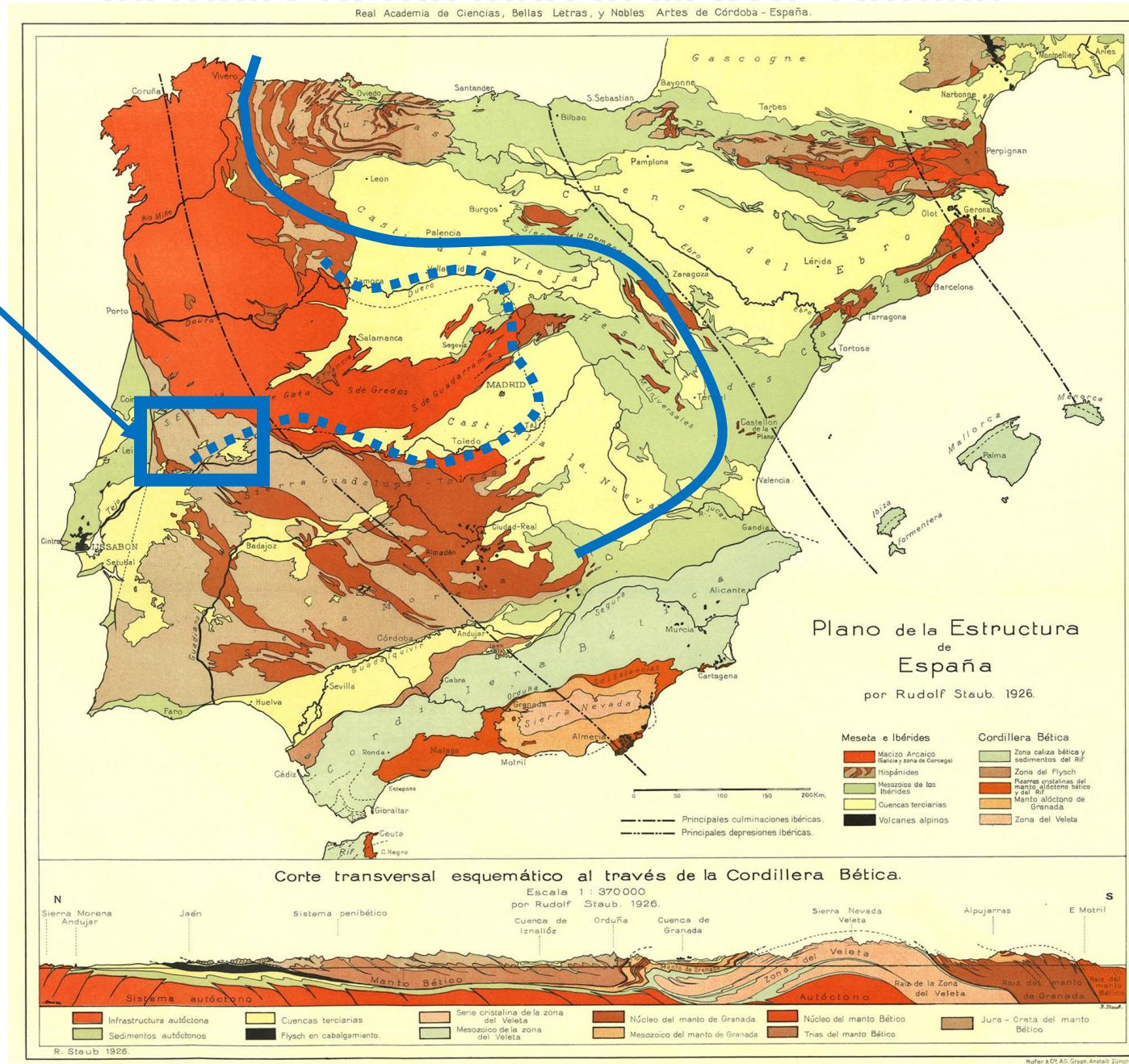
Ícaro Dias da Silva;

António Mateus; Ivo Martins



# Tectonics of the Iberian Massif: Outline

Gois-Panasqueira-Segura  
(GPS) strip



Staub (1927)  
Ideas sobre la tectónica  
de España

# Tectonics of the Iberian Massif: Outline

## MAPA TECTONICO de la Peninsula Ibérica y Baleares

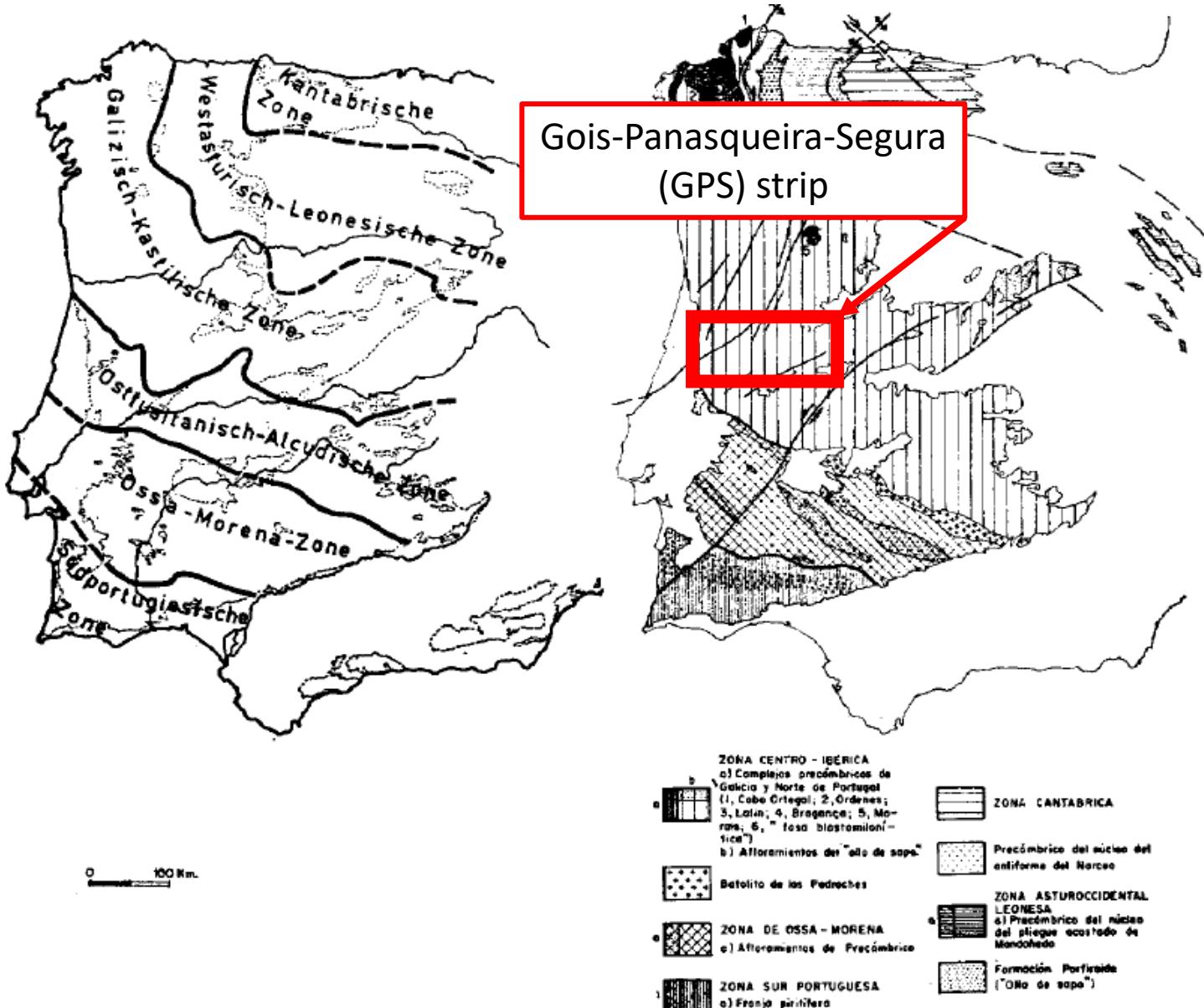
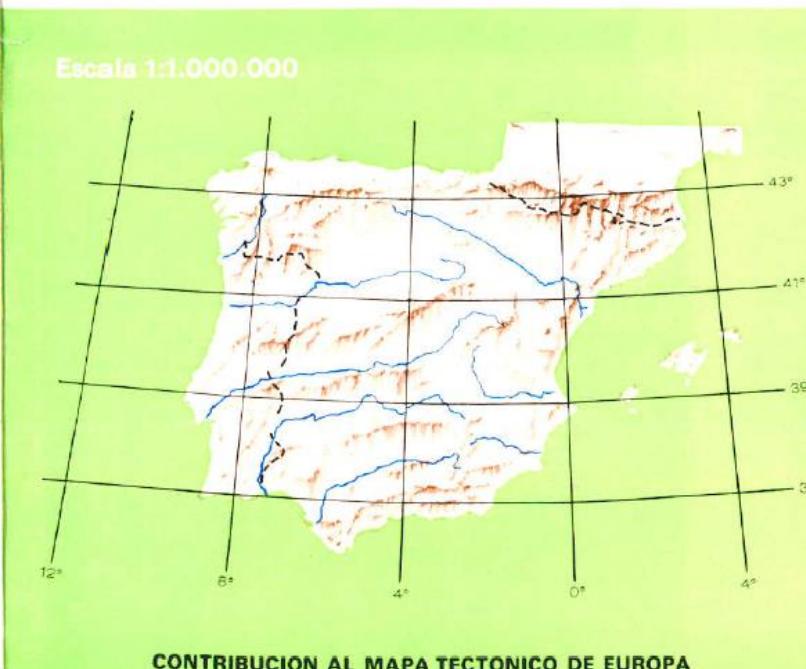
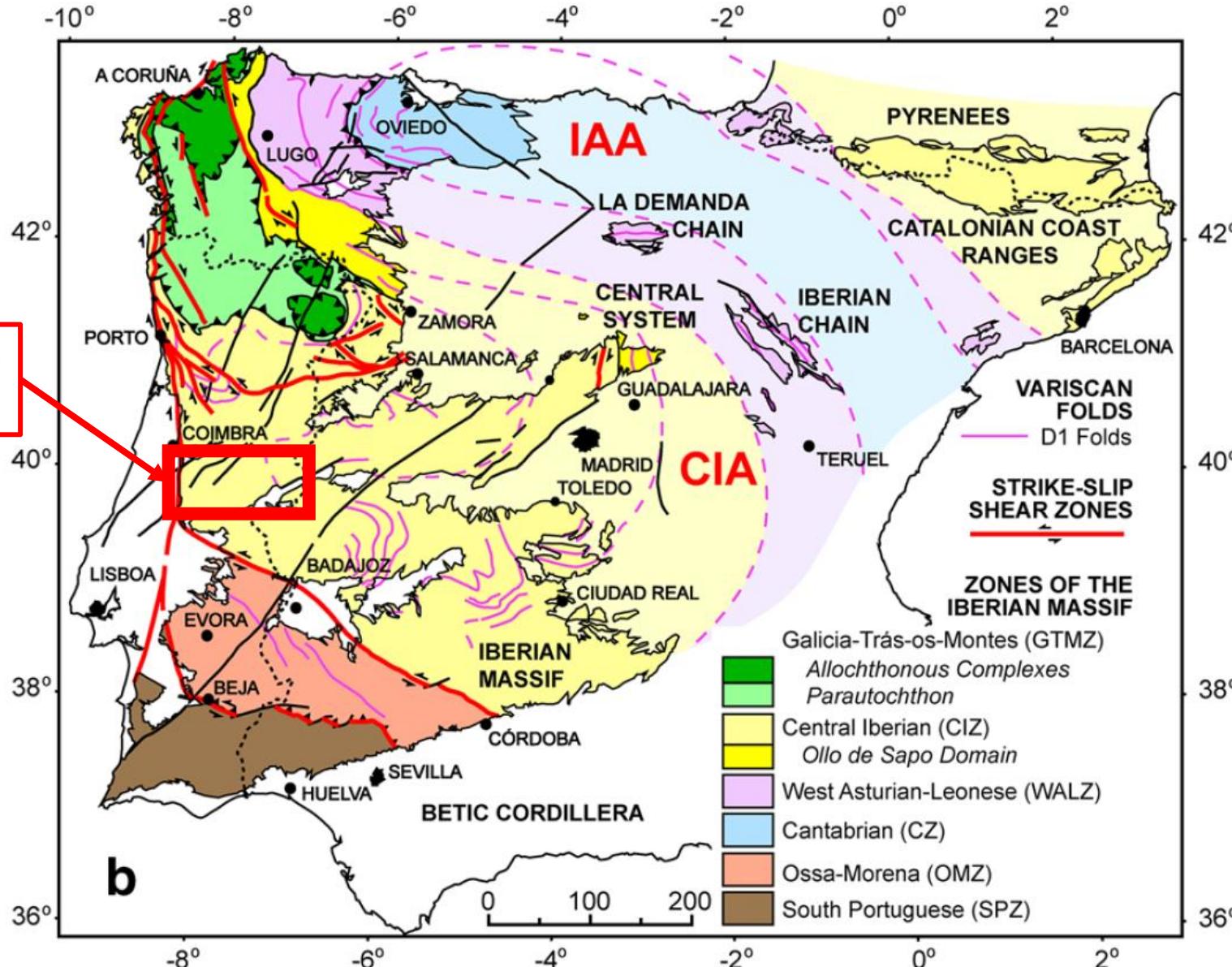


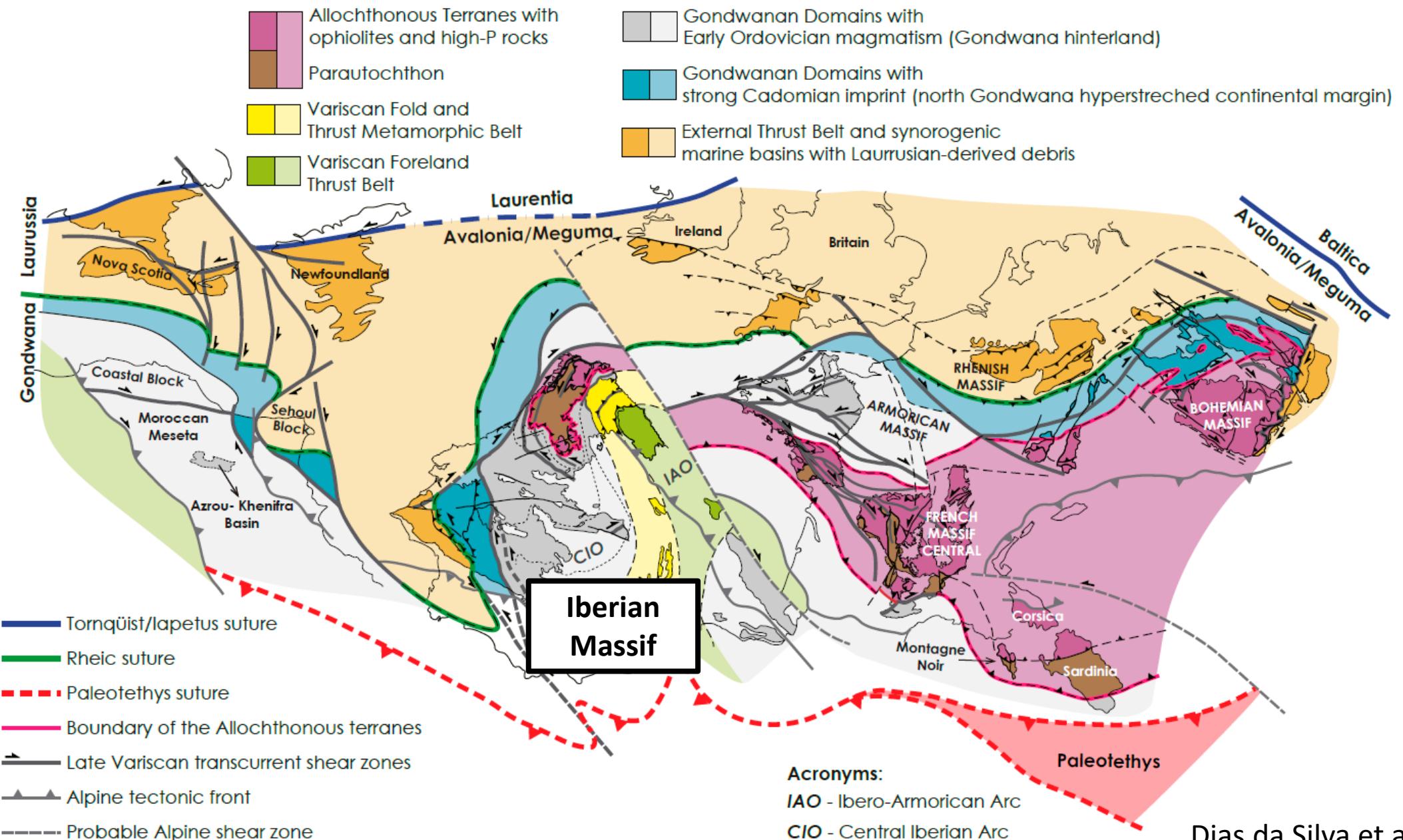
Fig. 1.—Comparación entre las zonas de LOTZE (1945), del herciniano de la Península Ibérica, en su forma original (izquierda), y en la forma en que han sido adoptadas en el Mapa Tectónico de la Península (derecha).

# Tectonics of the Iberian Massif: Outline

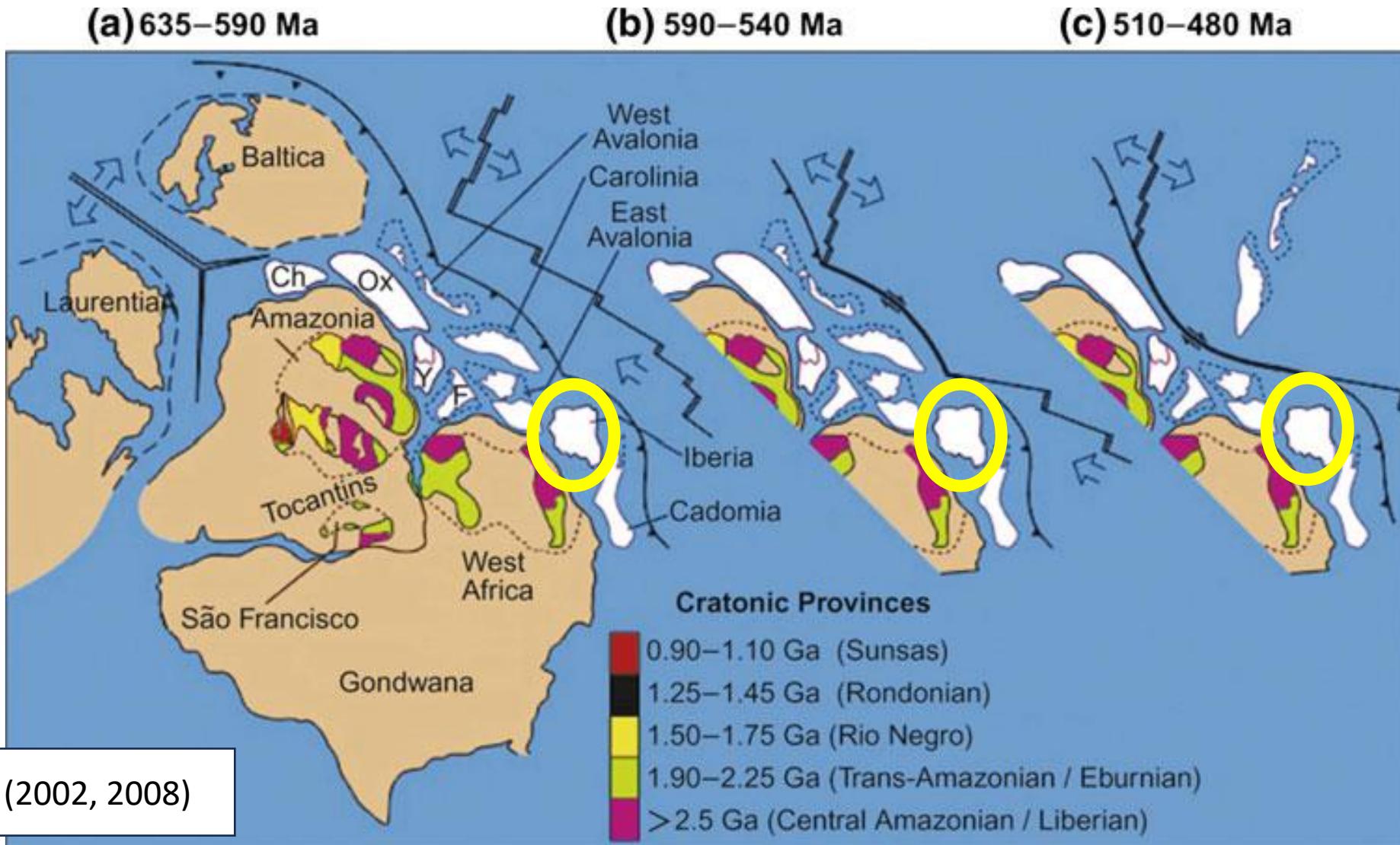
Gois-Panasqueira-Segura  
(GPS) strip



# Variscan Belt



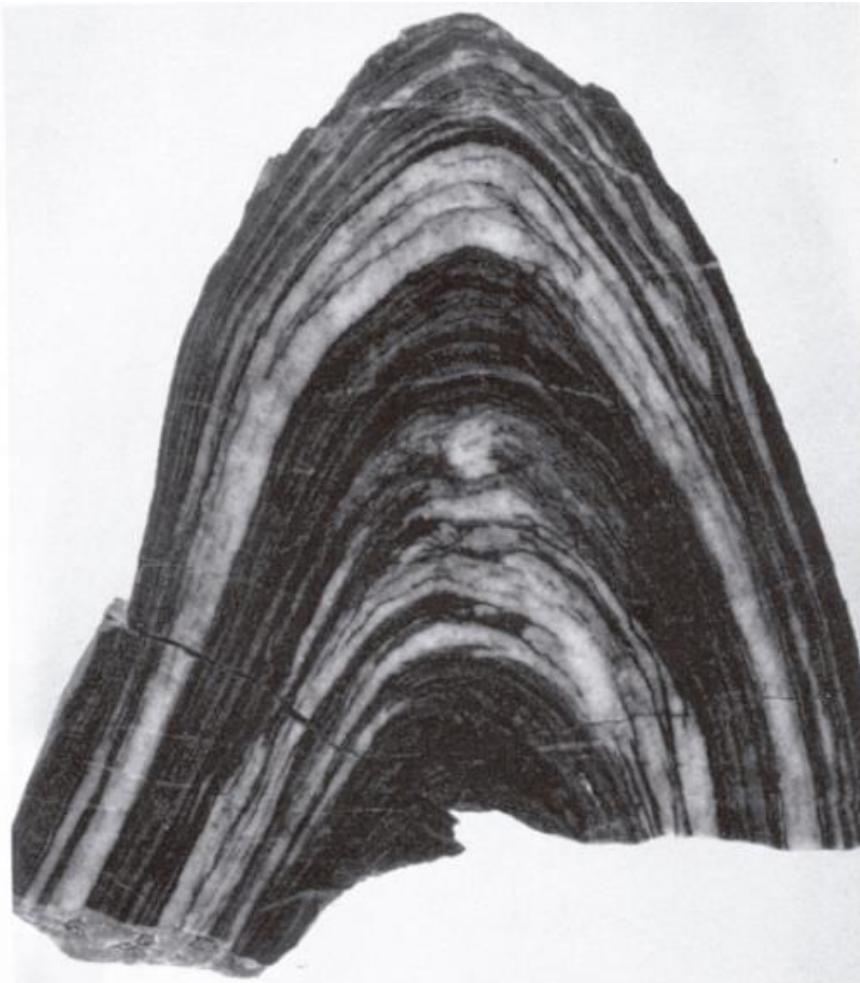
# The Tectonic evolution of the Variscan belt: From the Cadomian Orogeny to the opening of the Rheic Ocean



Nance et al. (2002, 2008)

# The Cadomian Orogeny

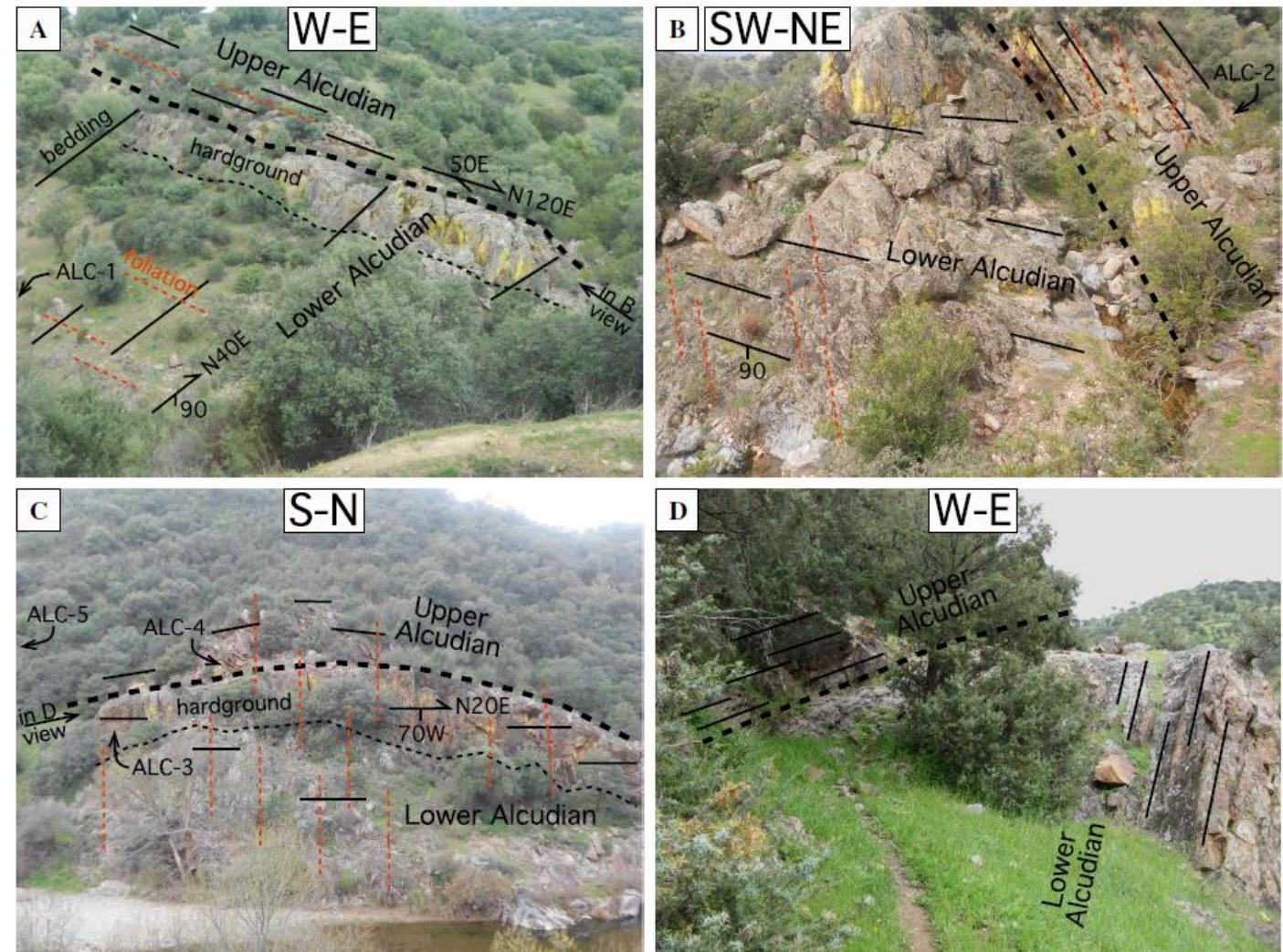
## Ossa Morena Zone



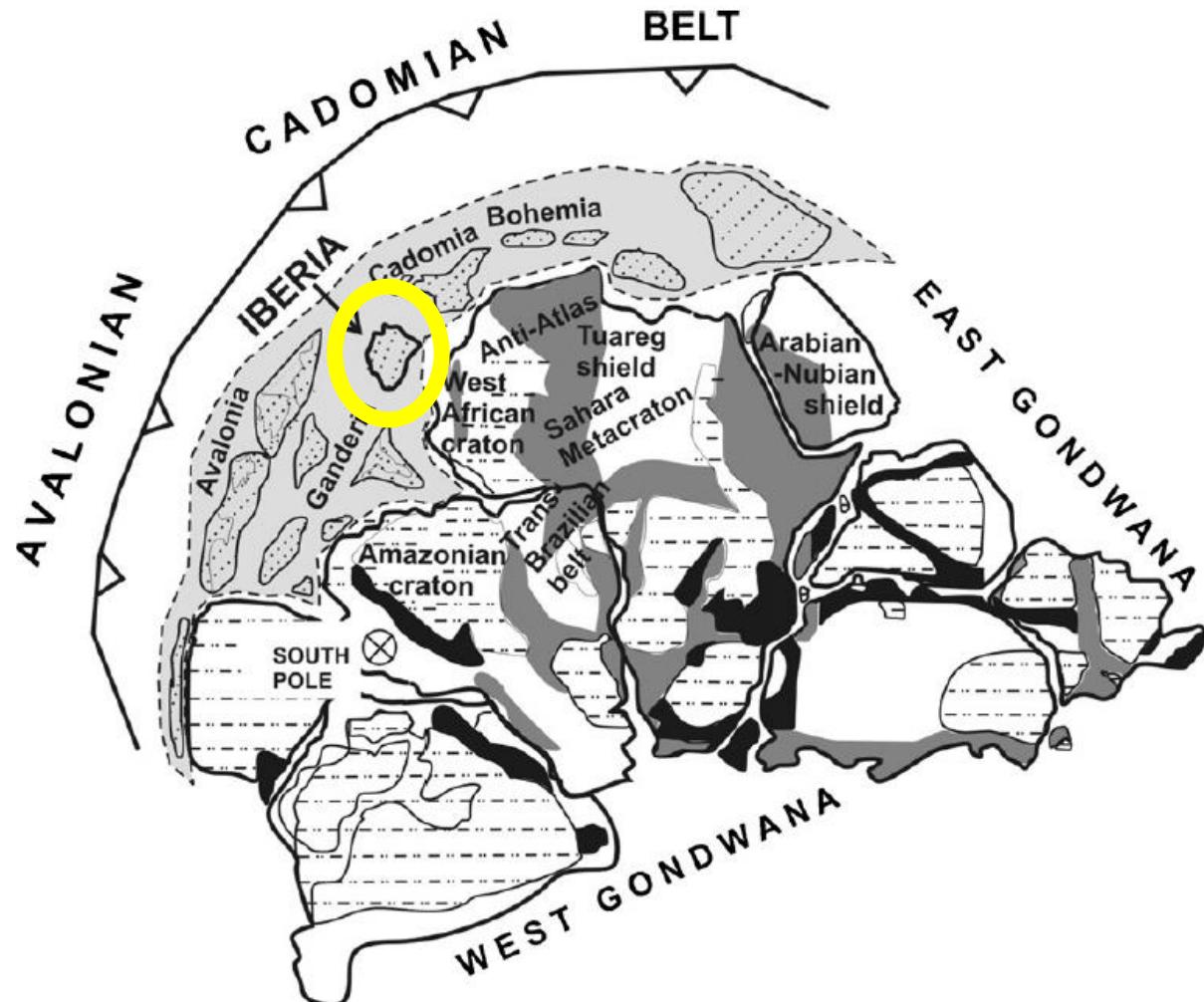
**Fig. 4.** Interference folding pattern shown by a black chert clast included in lower Cambrian conglomerates

Apalategui, Eguiluz and Quesada (1990)

## Central Iberian Zone?



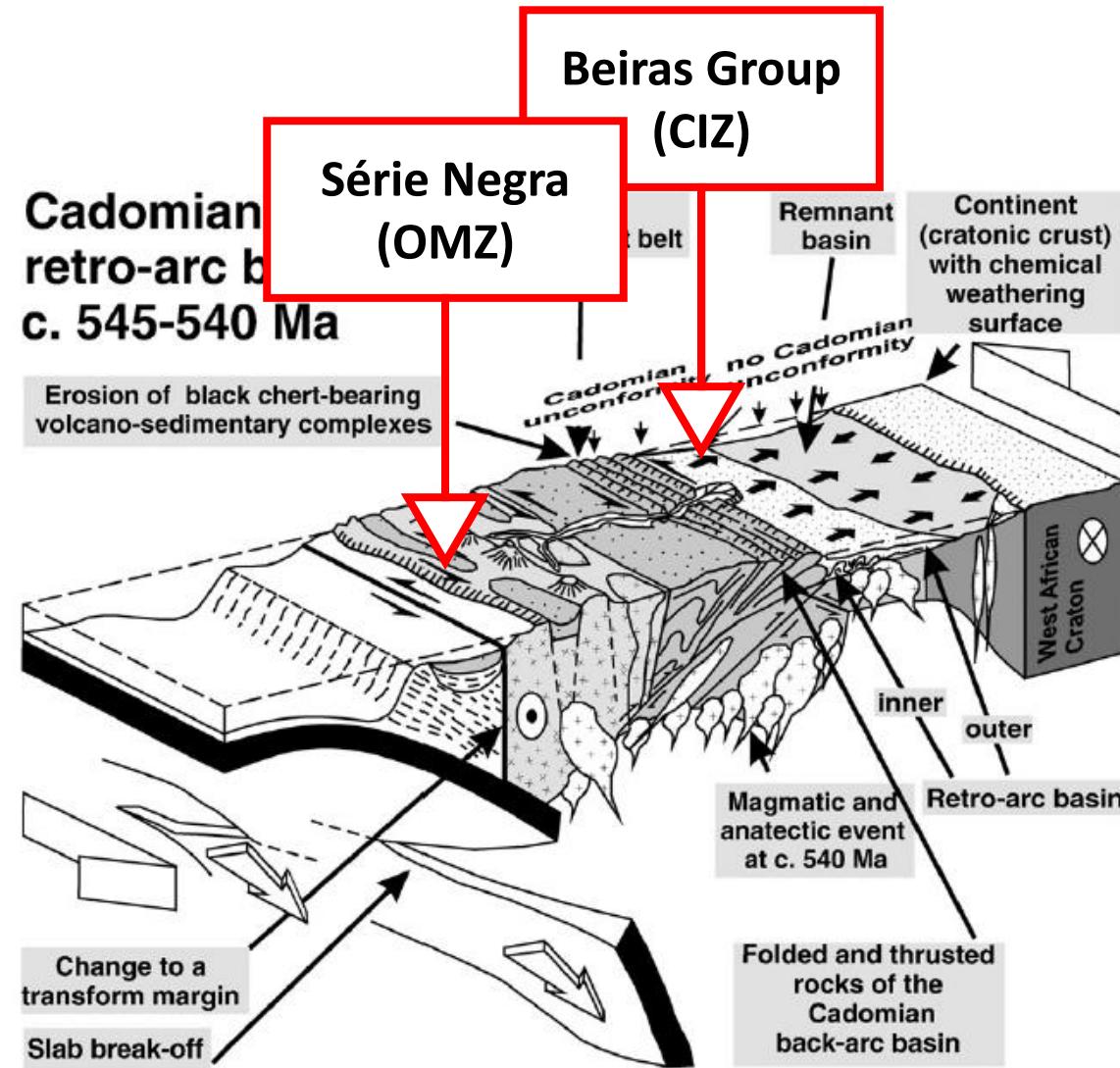
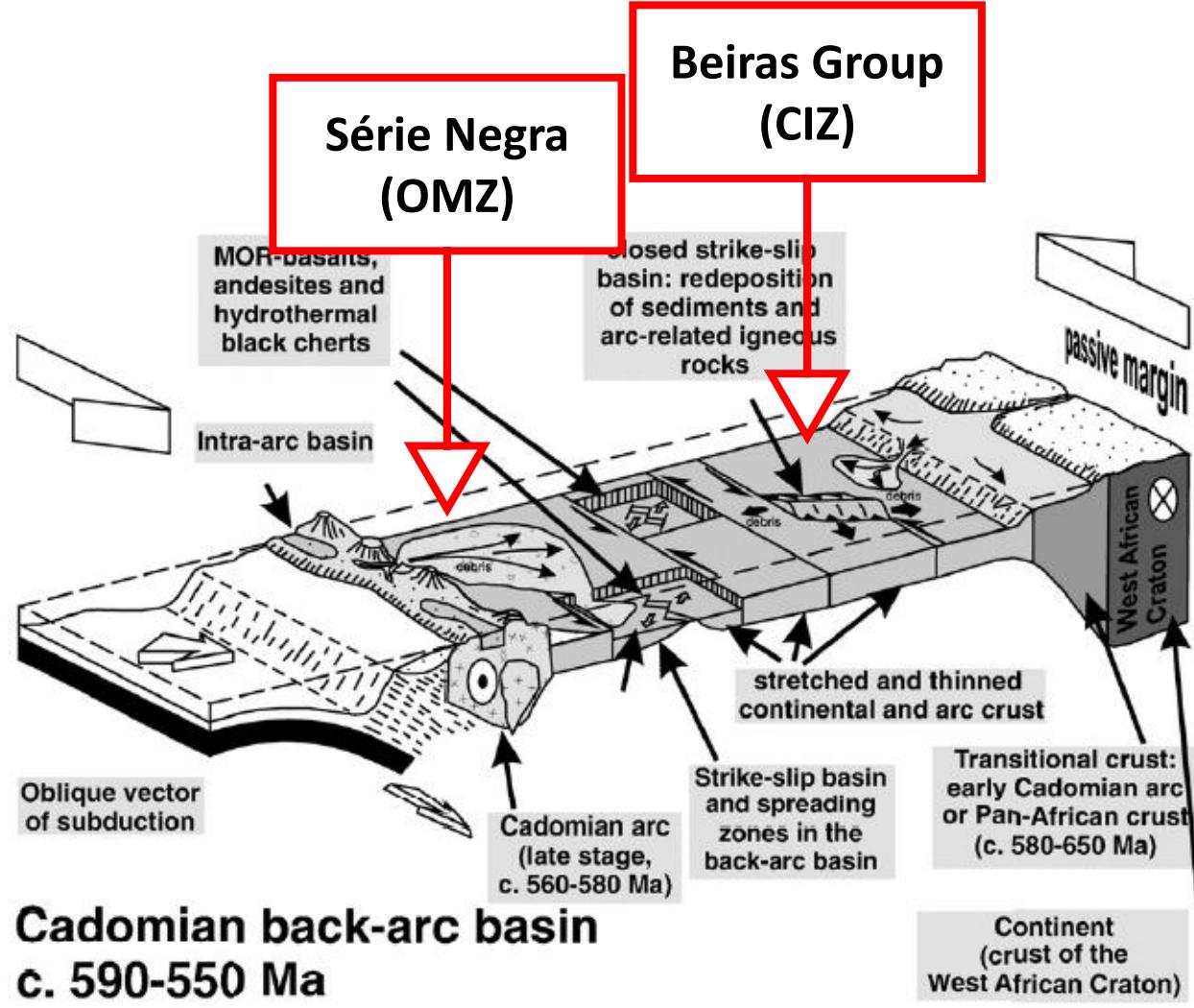
**Fig. 2** Field relationships for the intra-Alcudian unconformity at the two selected locations (P Solanilla del Tamaral (c, d) Talavera et al. (2015) 1d



**LATEMOST NEOPROTEROZOIC**  
c. 570-560 Ma

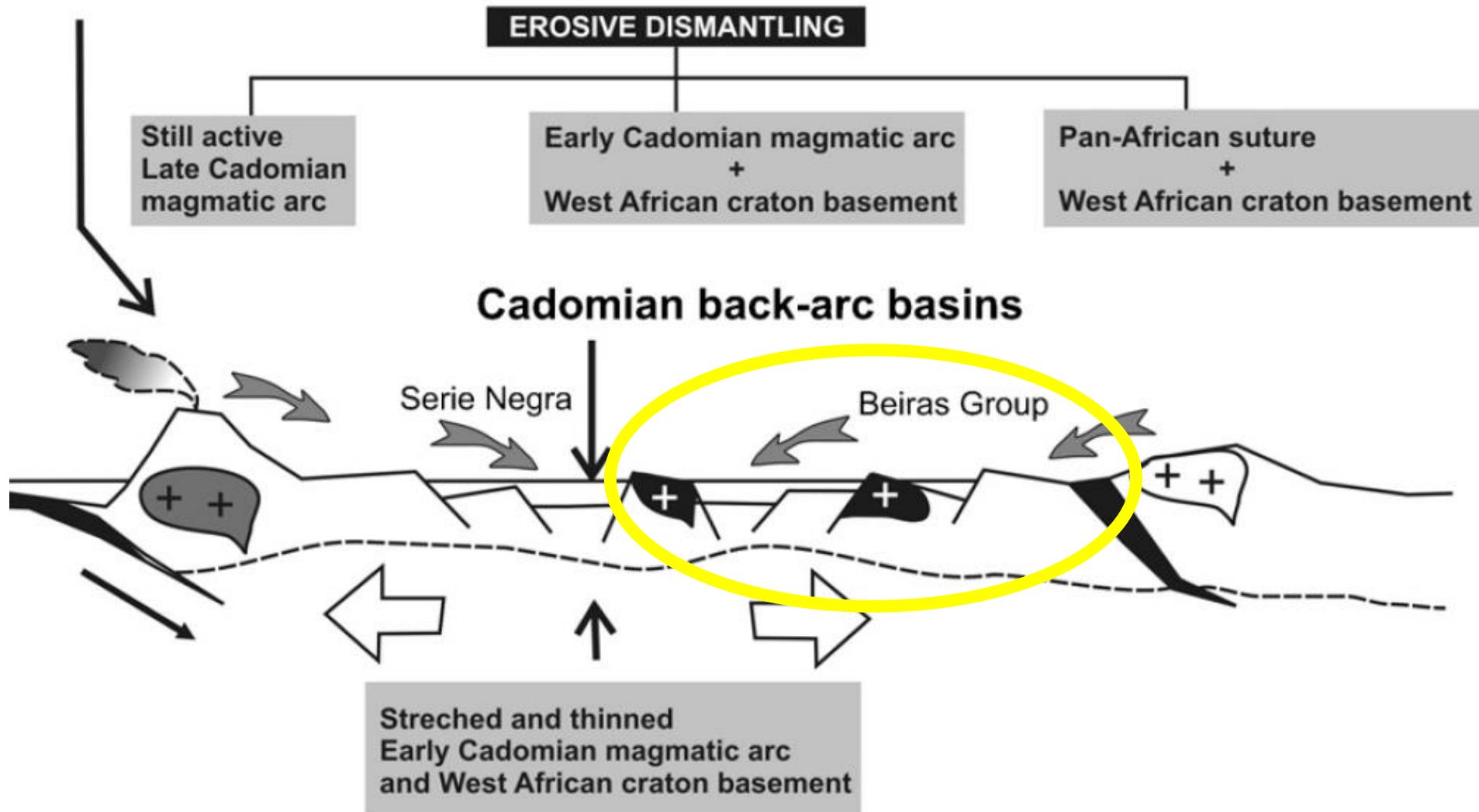
- Neoproterozoic peri-Gondwanan related rocks (Cadomian and related events)
- Neoproterozoic Gondwanan related rocks (Pan-African and related events)
- Mesoproterozoic Gondwanan related rocks (Grenvillian and related events)
- Archean-Palaeoproterozoic cratonic rocks

Linnemann et al (2008)

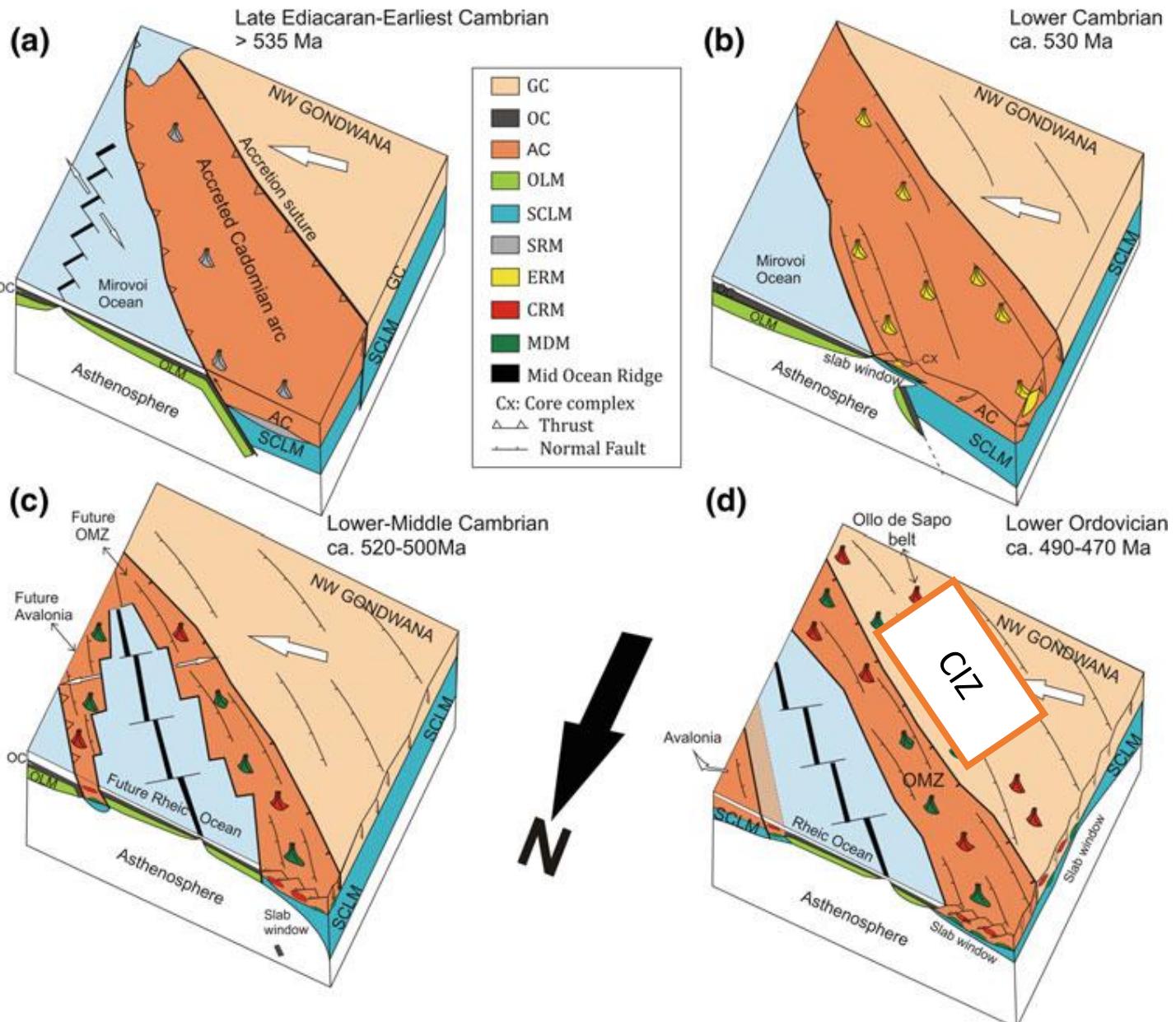


# Cadomian back-arc: The Beiras Group

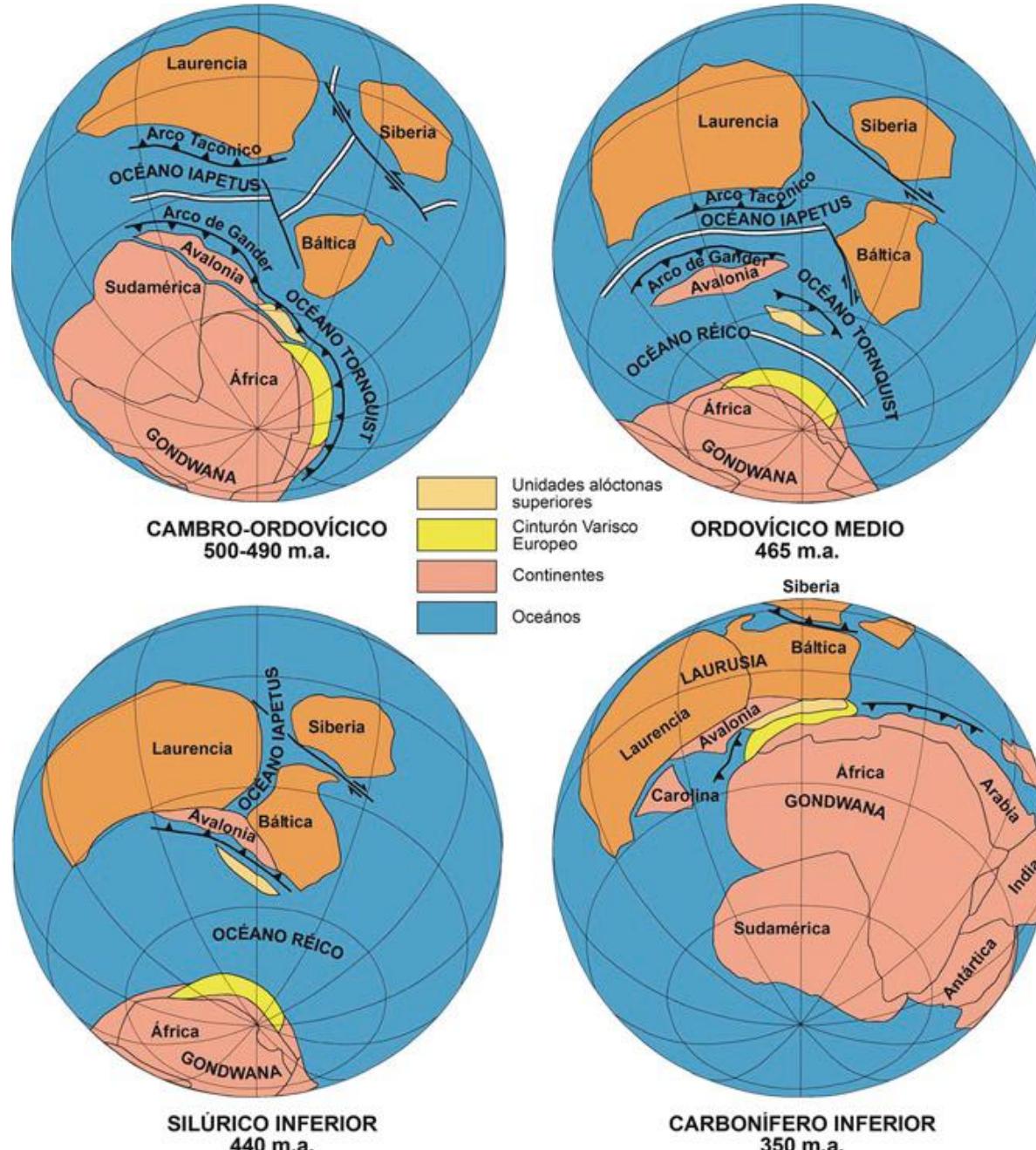
Late Cadomian  
magmatic arc  
c. 635-545 Ma



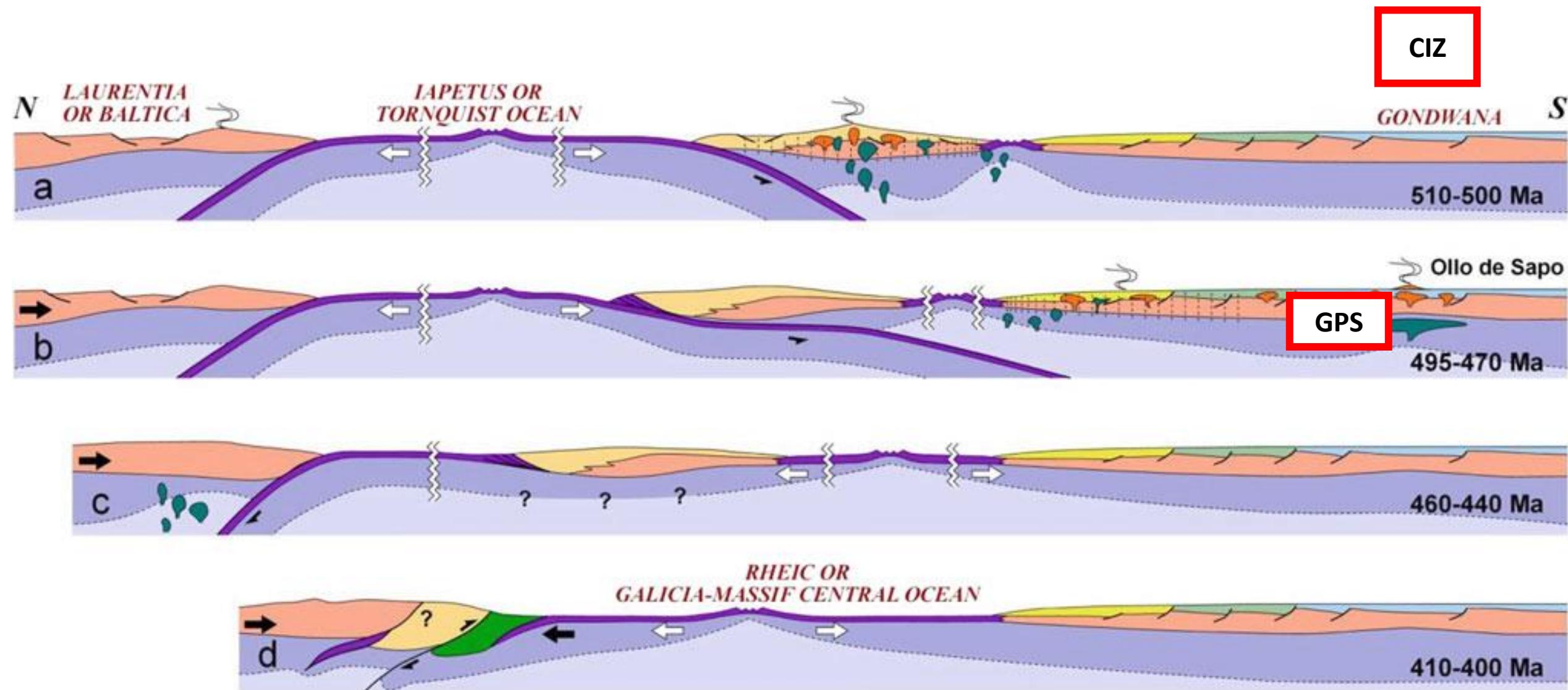
# From subduction to rifting



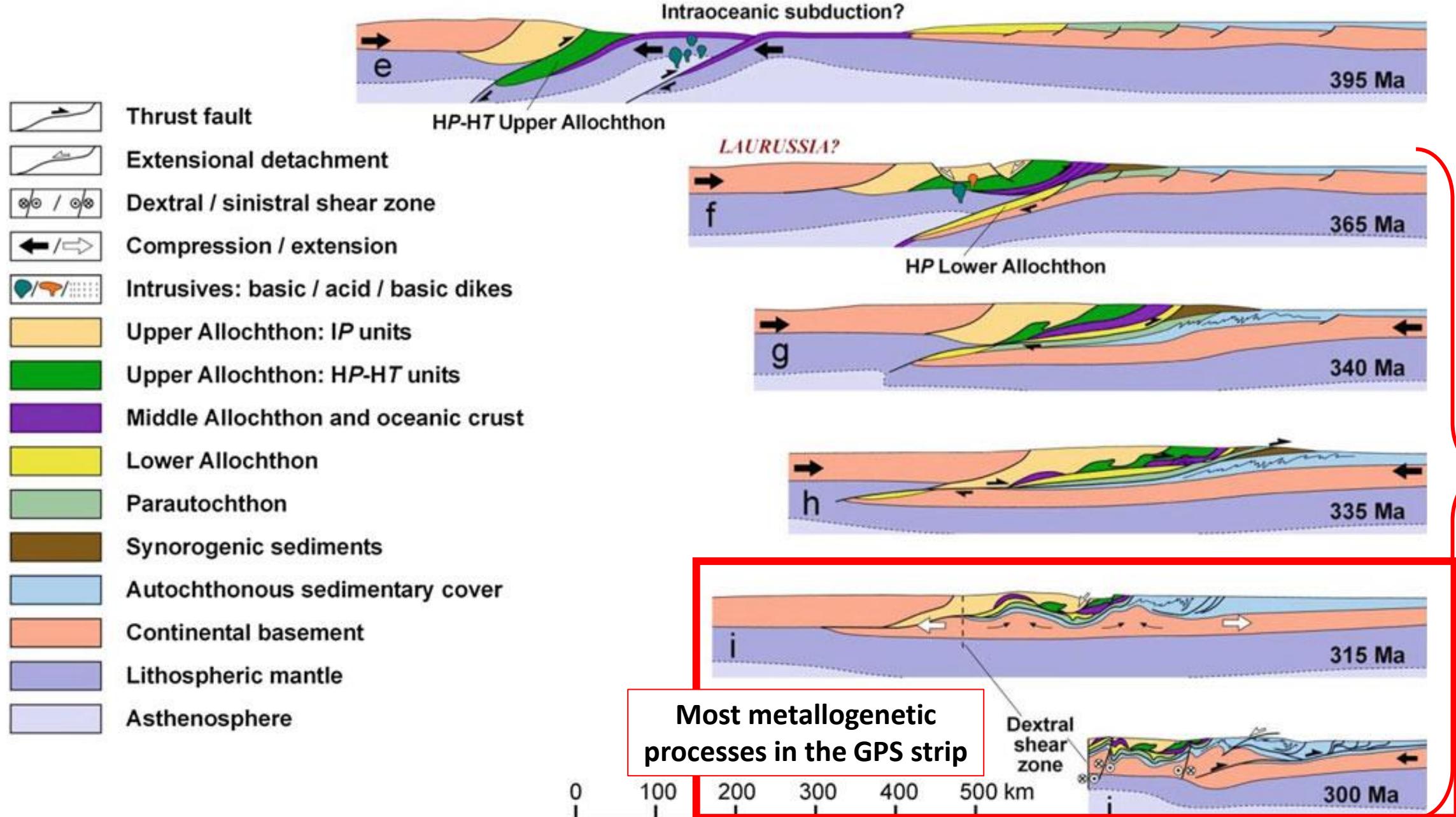
# From drifting to the Variscan continental collision



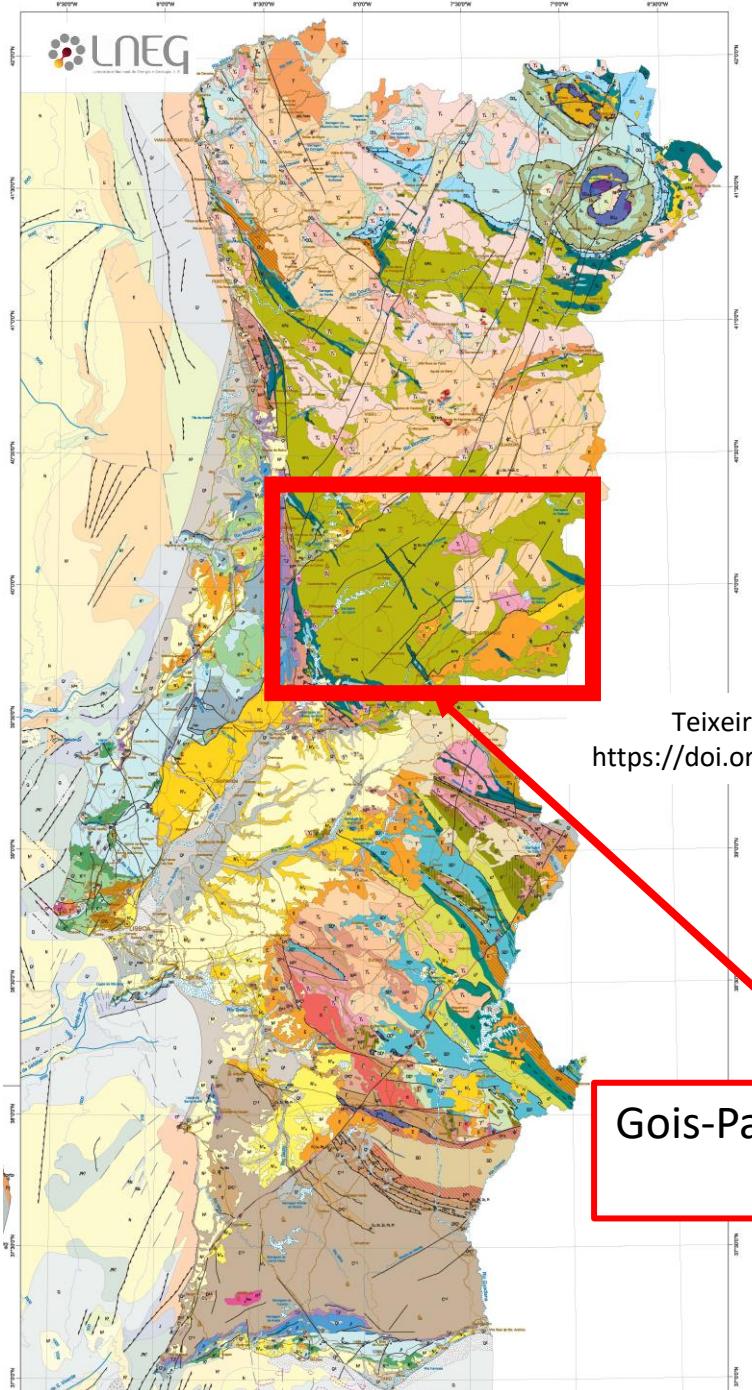
# The Tectonic evolution of the Iberian Massive: Outline and major events.



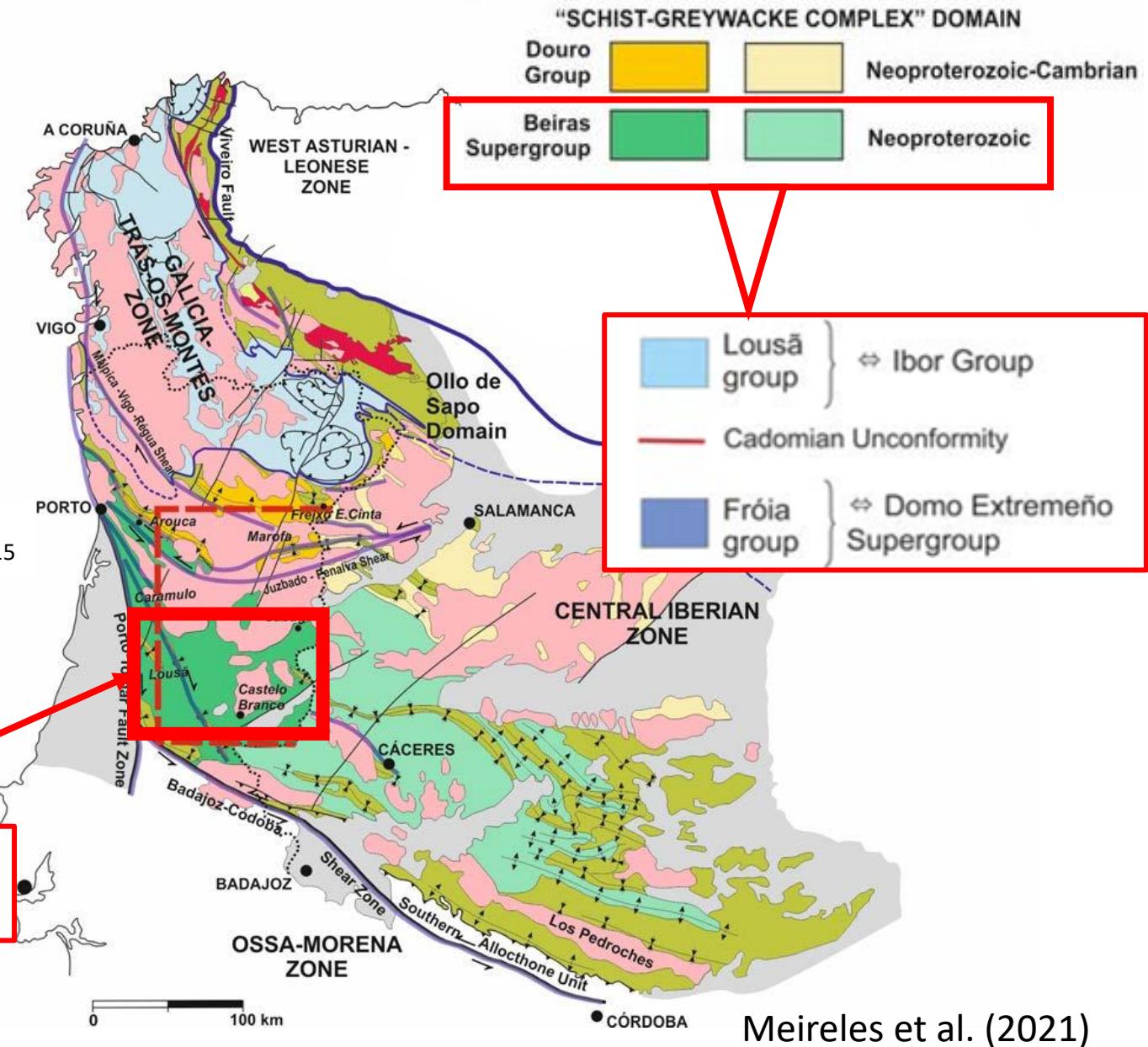
# The Variscan orogeny



Continental collision



# The Cadomian cycle in the Beiras Group



# Harmonized geological map 1:100.000

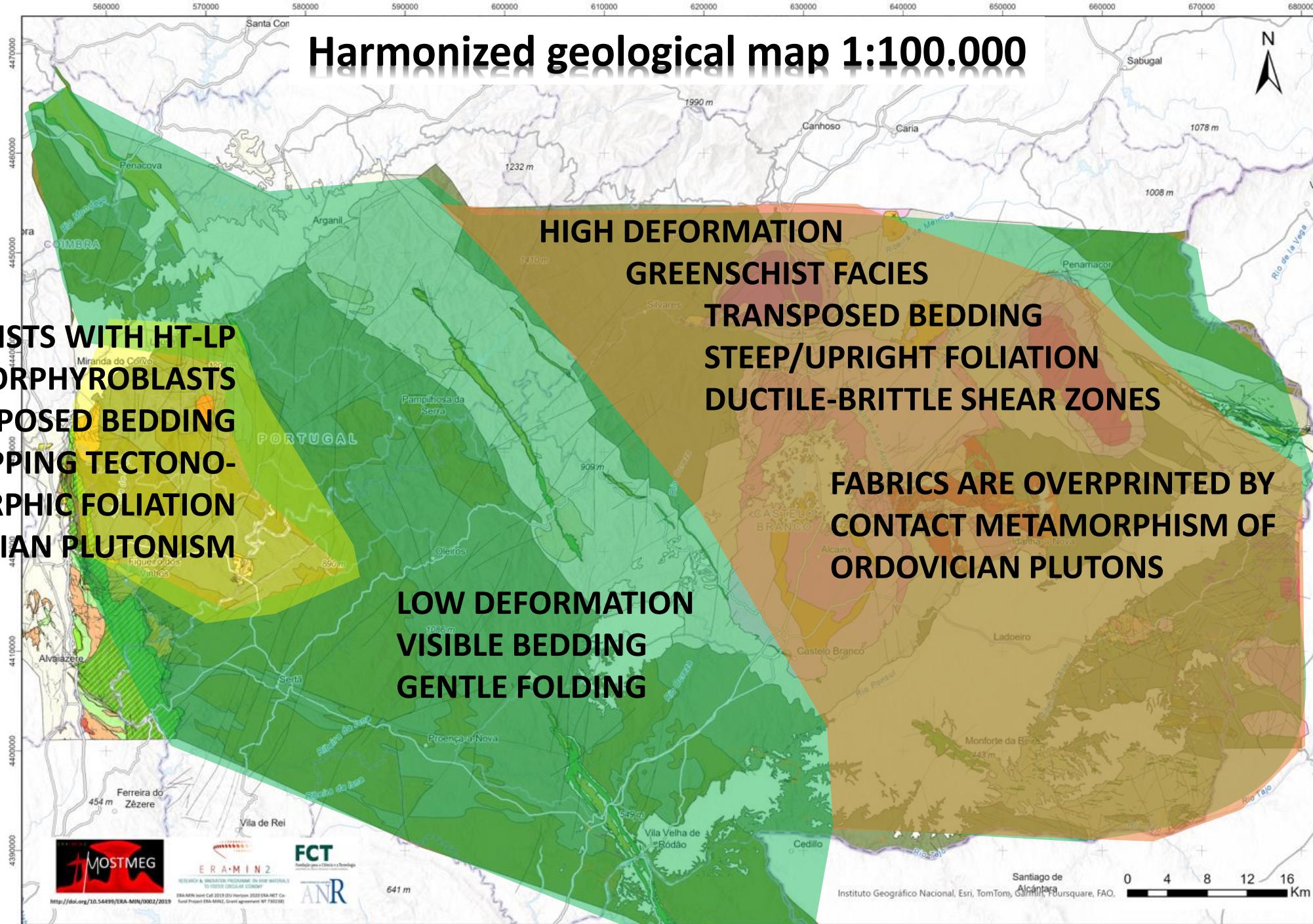
MICASCHISTS WITH HT-LP  
PORPHYROBLASTS  
TRANSPOSED BEDDING  
GENTLY DIPPING TECTONO-  
METAMORPHIC FOLIATION  
CADOMIAN PLUTONISM

HIGH DEFORMATION  
GREENSCHIST FACIES

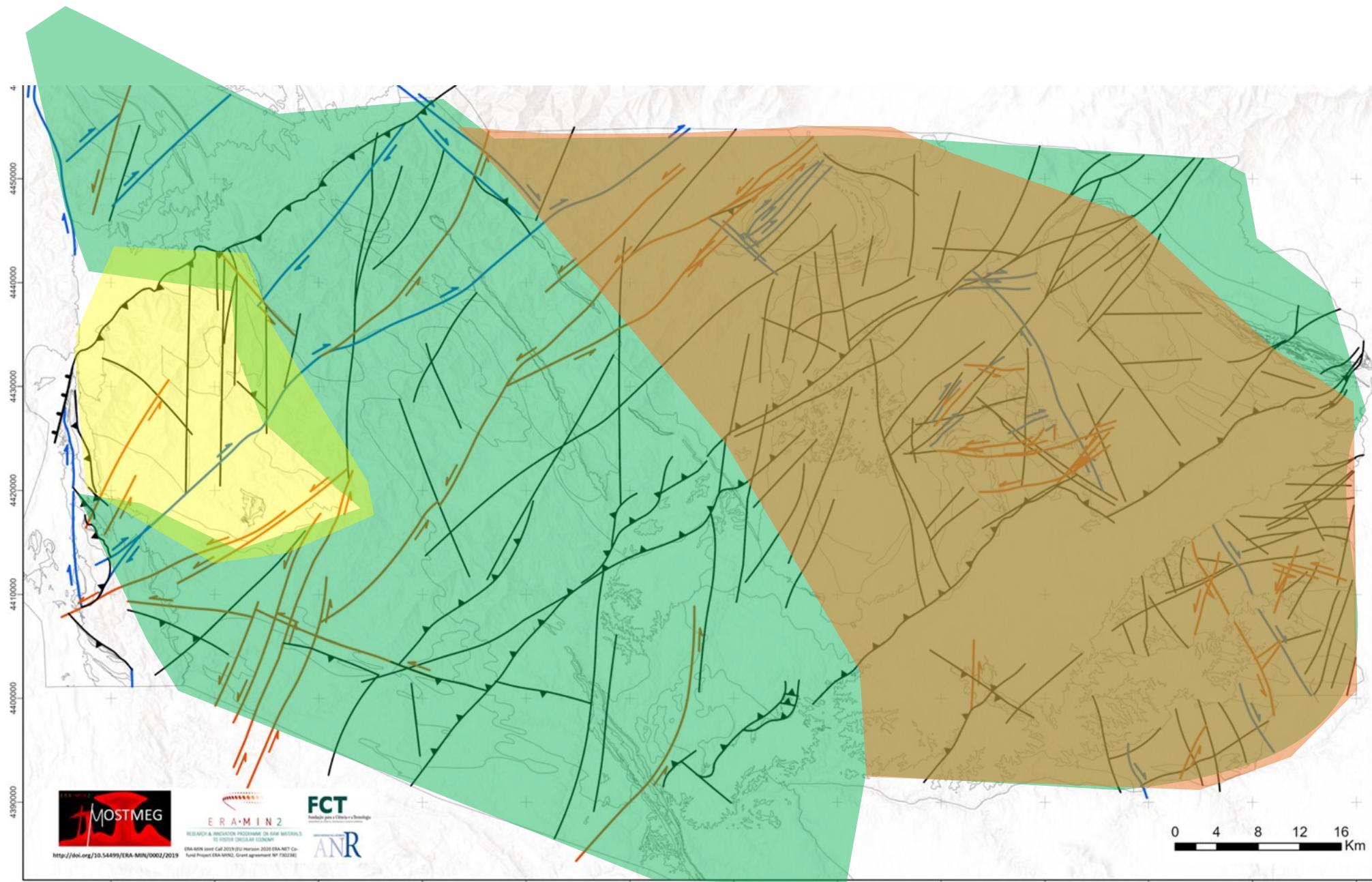
TRANSPOSED BEDDING  
STEEP/UPRIGHT FOLIATION  
DUCTILE-BRITTLE SHEAR ZONES

LOW DEFORMATION  
VISIBLE BEDDING  
GENTLE FOLDING

FABRICS ARE OVERPRINTED BY  
CONTACT METAMORPHISM OF  
ORDOVICIAN PLUTONS



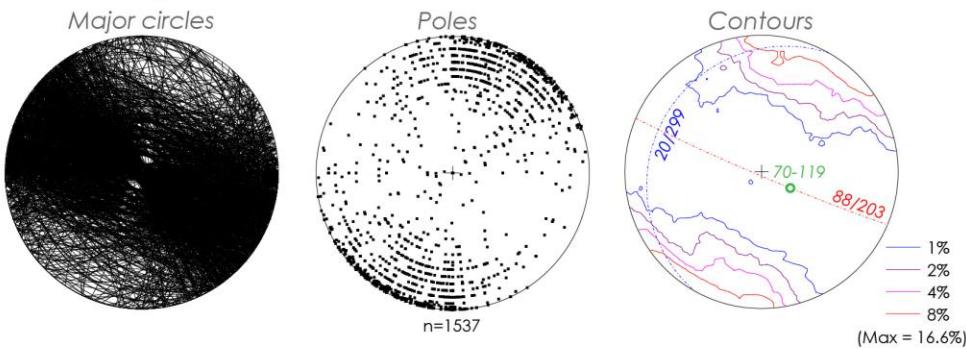
# Main Shear Zones



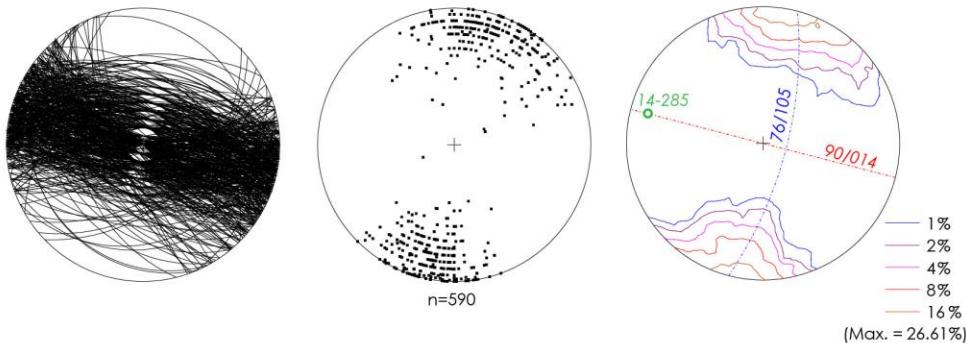
# MOSTMEG-ERAMIN2 Project

**Stereographic projection:** fabric measurements; regional | **Data source:** 1:50.000 geological maps (published and unpublished by LNEG)

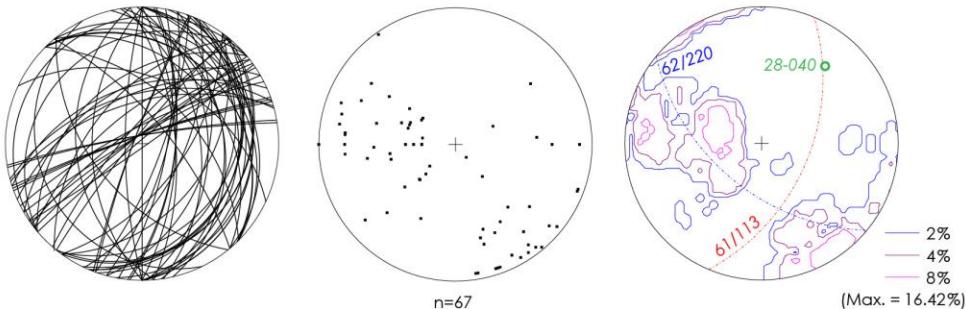
Bedding ( $S_0$ )



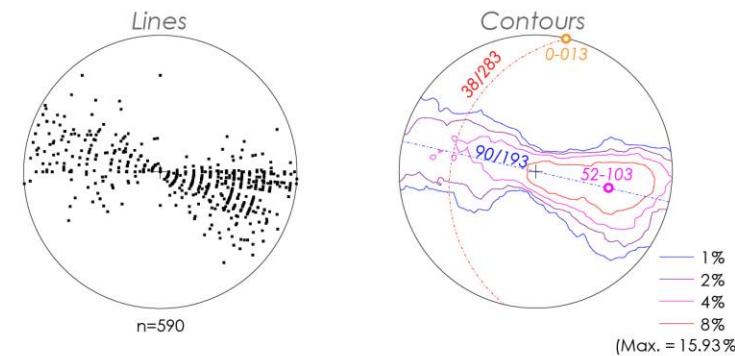
$S_1$  foliation



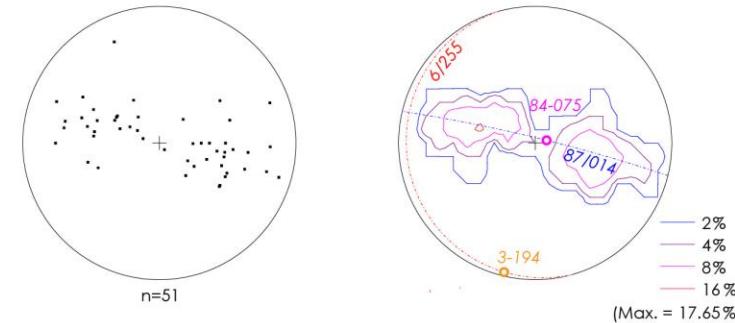
$S_2$  foliation



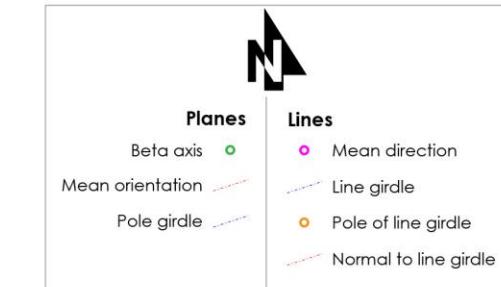
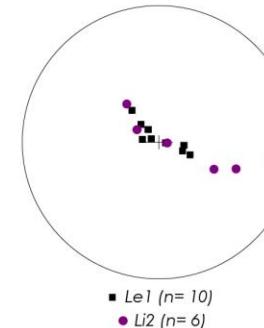
Intersection lineation ( $Li_1$ )

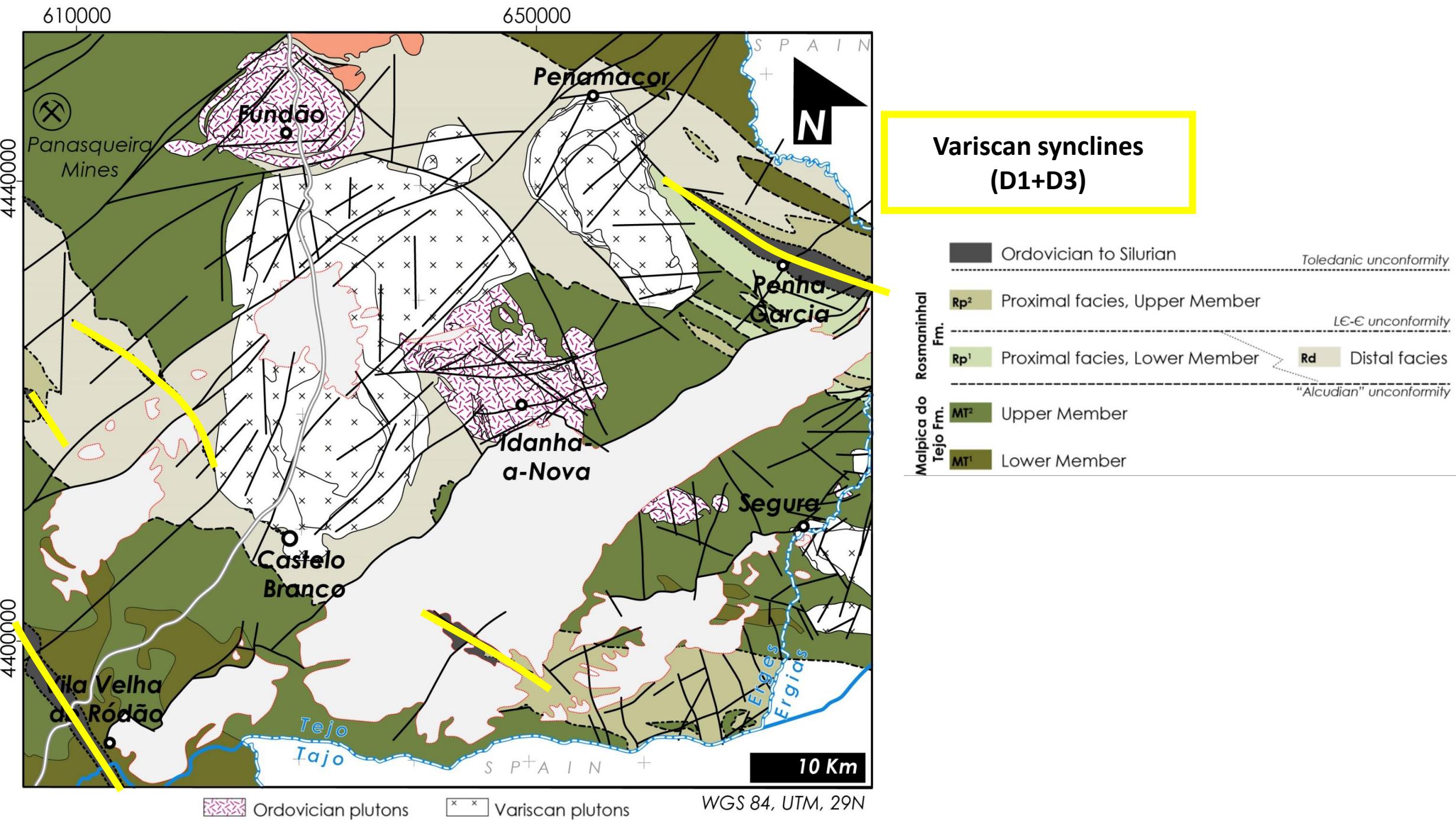


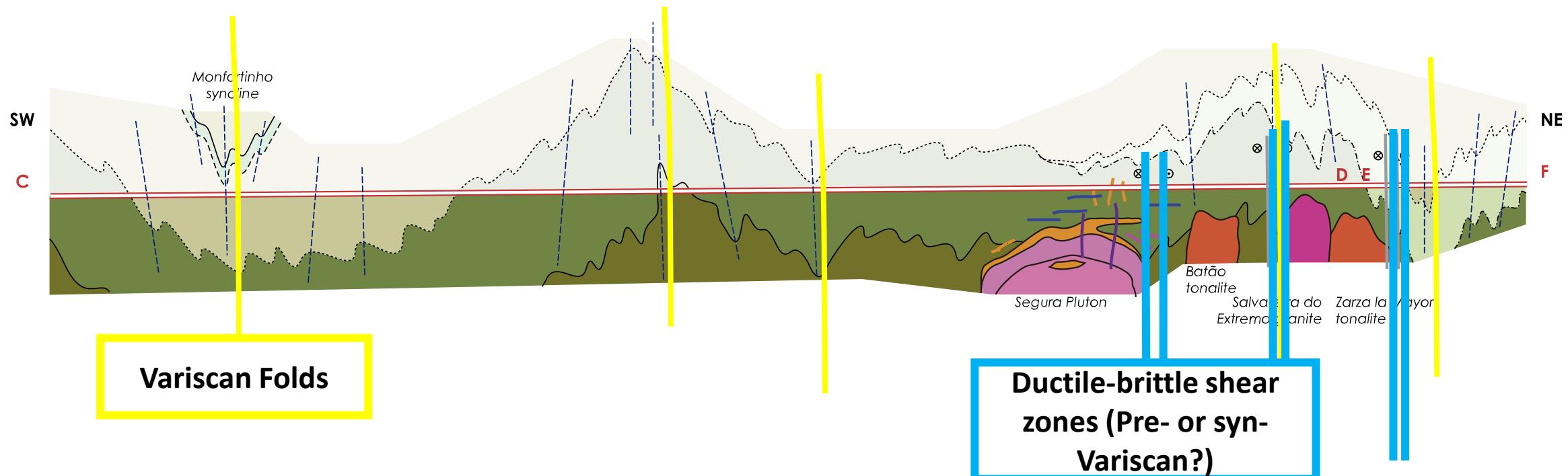
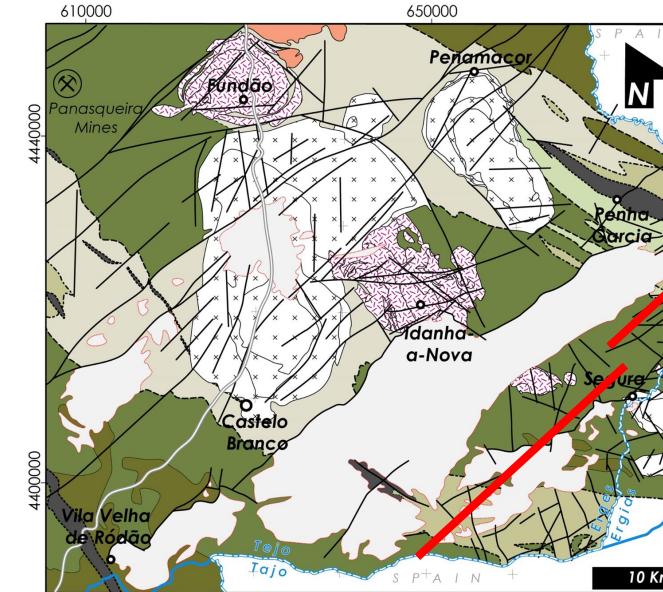
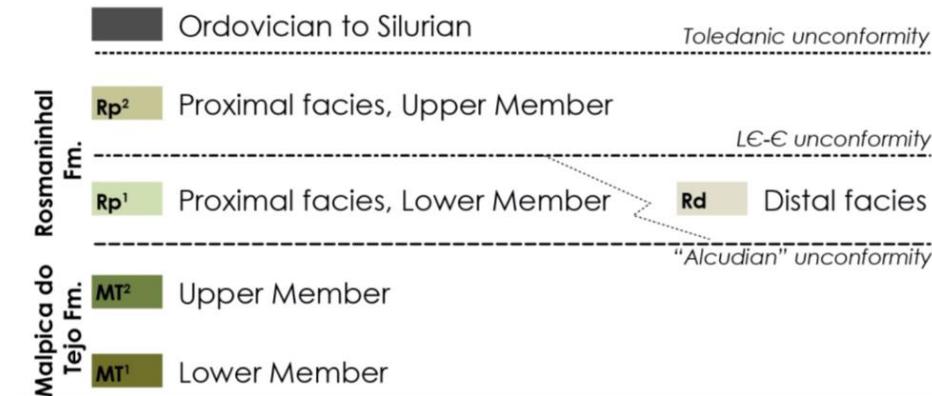
Fold axes ( $Lx_1$ )

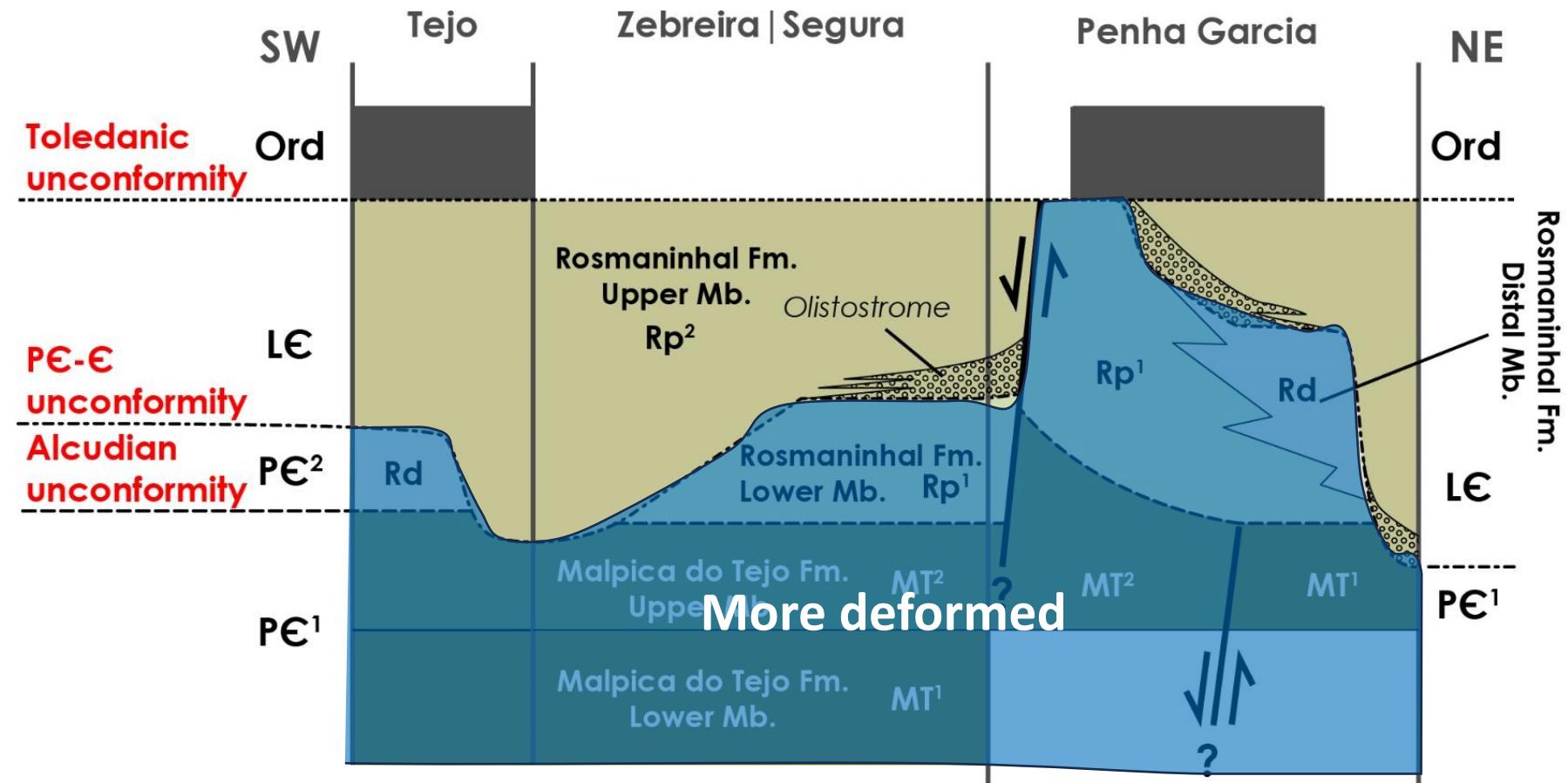
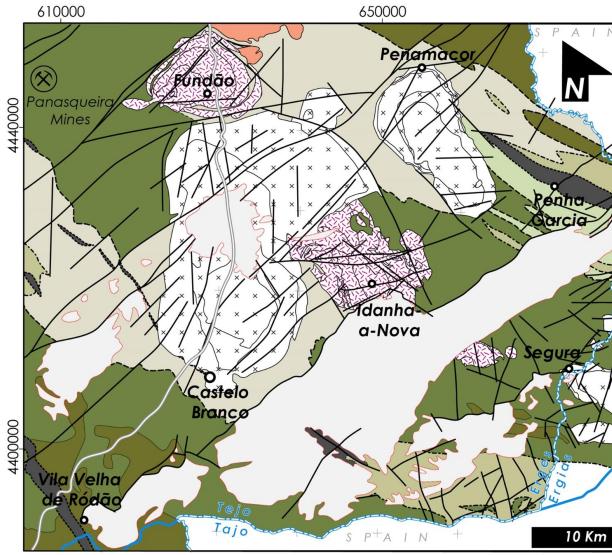
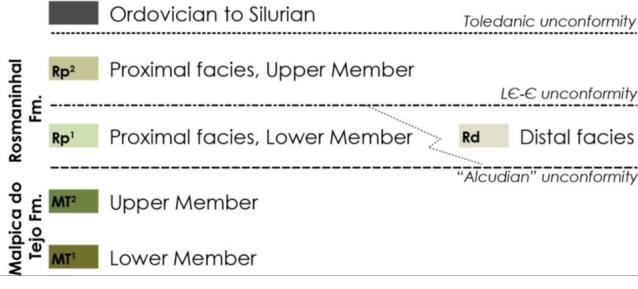


Stretching lineation ( $Le_1$ ) and second intersection lineation ( $Li_2$ )



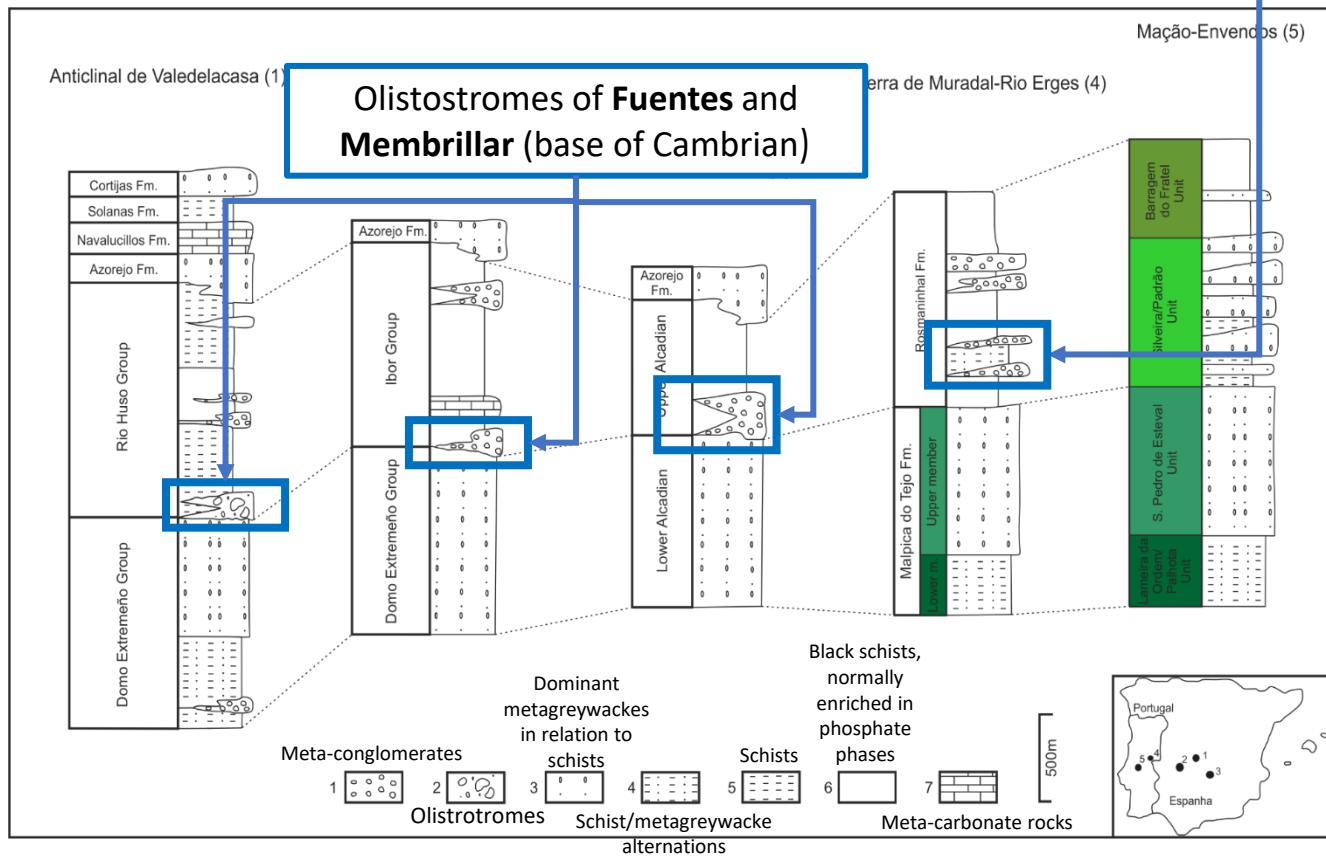






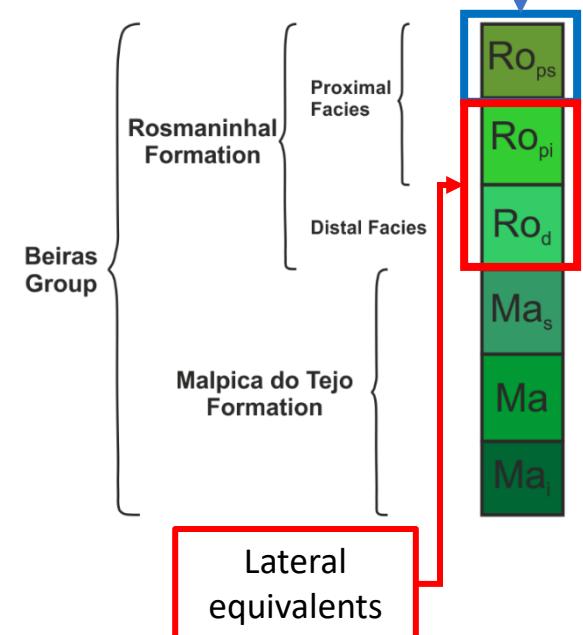
# Lower Paleozoic breakup to drifting

(Martins, 2020, after Ferreira da Silva, 2013)



Includes the conglomerates of  
**Cabeço das Poupas** (Sequeira et al.  
1996; Meireles et al., 2021)

Neoproterozoic to  
lower Cambrian(?)



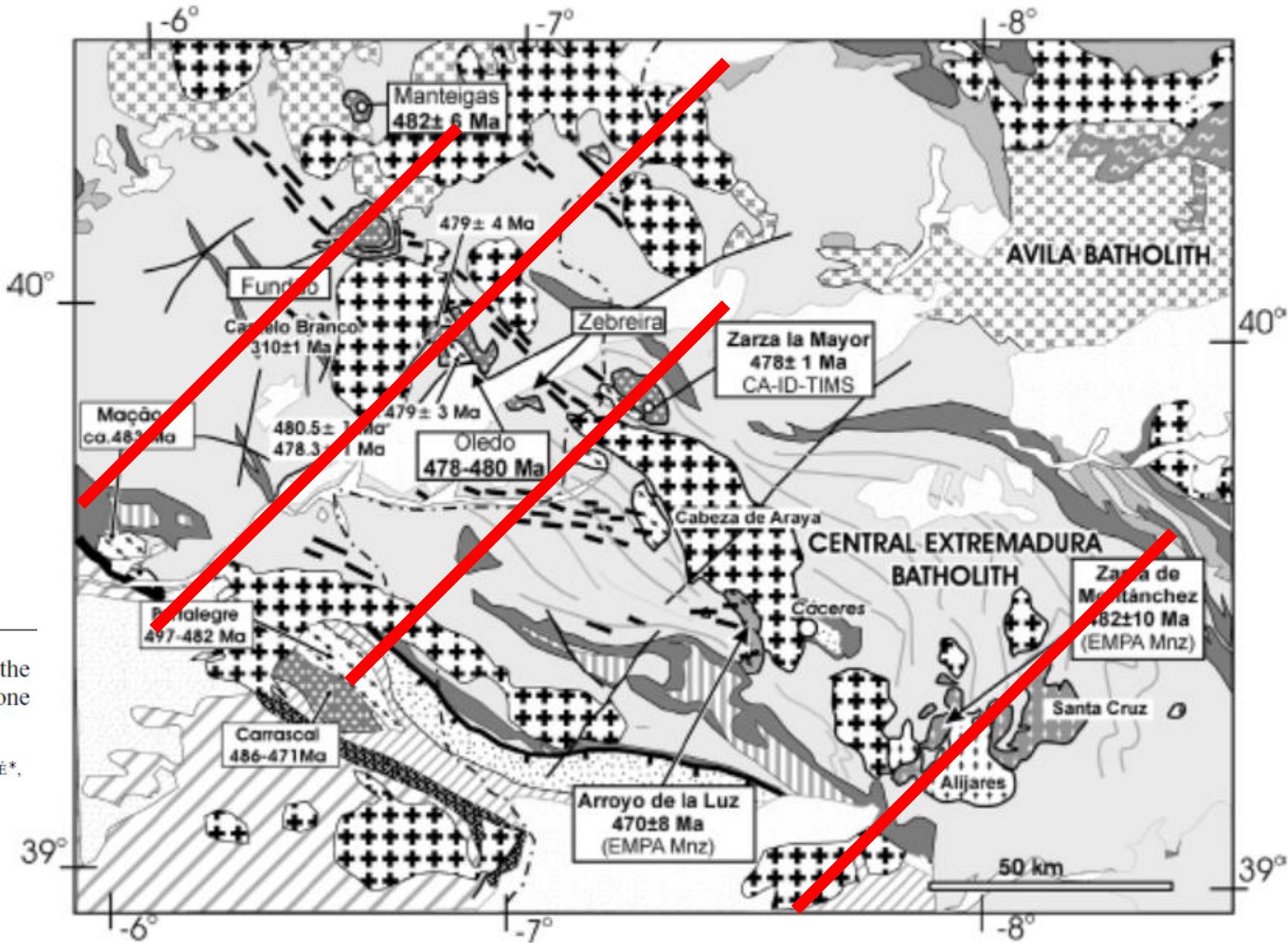
# Structure of N-Gondwana margin NW-SE direction? Evidence of the CIO?

Geol. Mag. 149 (5), 2012, pp. 927–939. © Cambridge University Press 2012  
doi:10.1017/S0016756811001129

## RAPID COMMUNICATION

An Early Ordovician tonalitic–granodioritic belt along the Schistose-Greywacke Domain of the Central Iberian Zone (Iberian Massif, Variscan Belt)

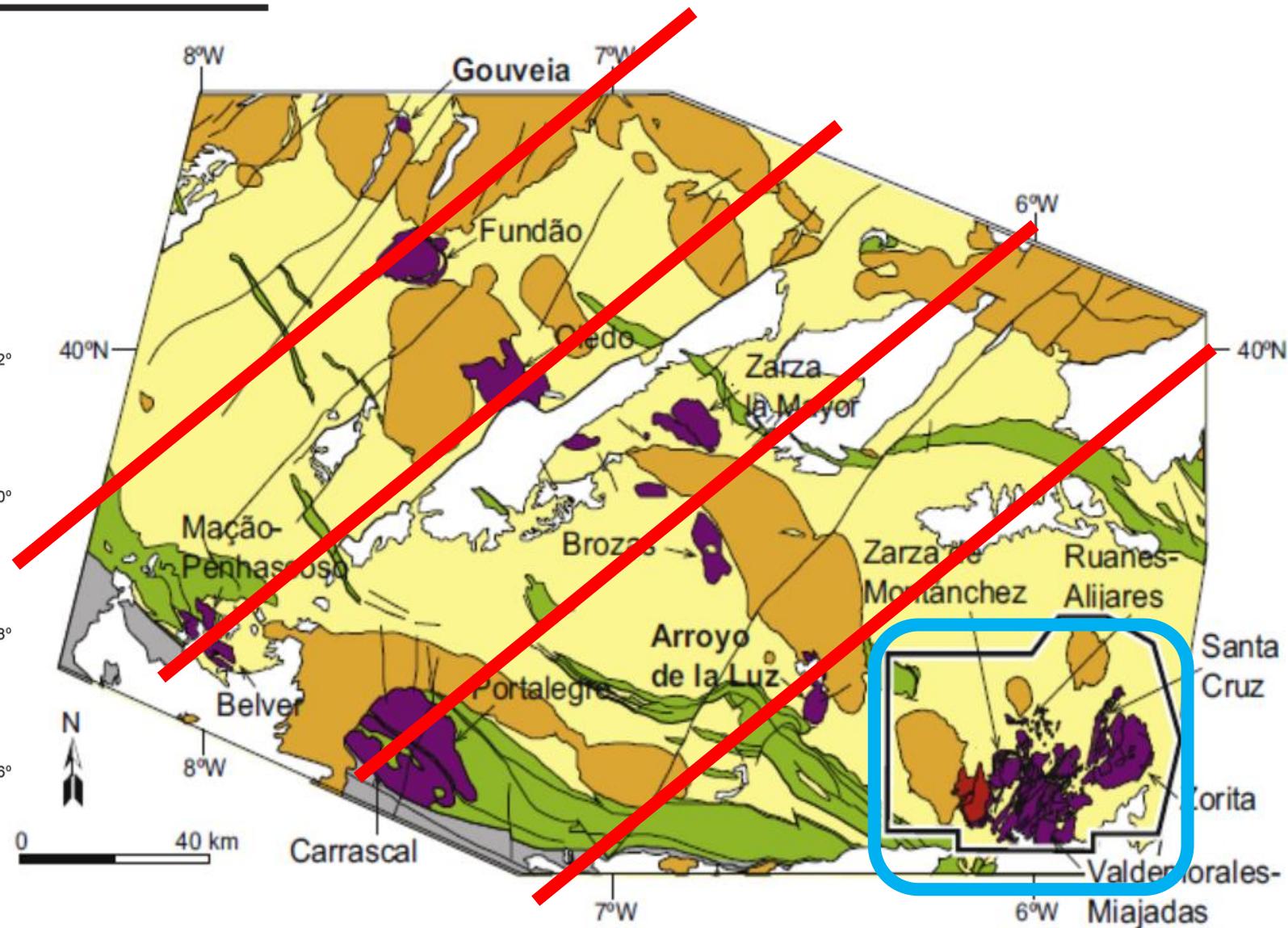
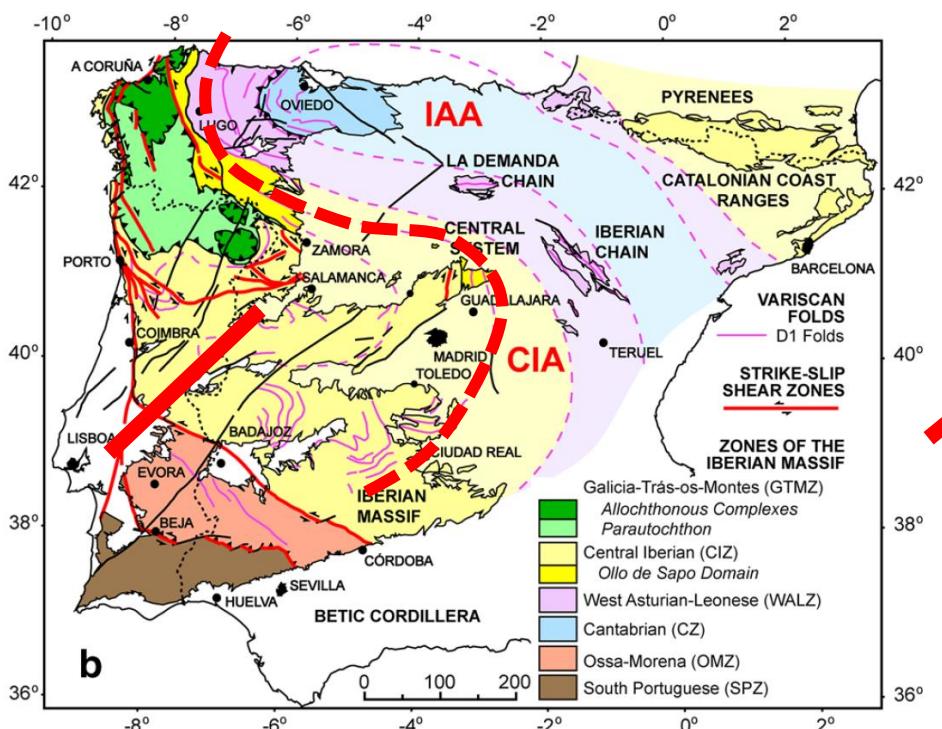
A. RUBIO-ORDÓÑEZ\*, P. VALVERDE-VAQUERO†‡, L. G. CORRETGÉ\*,  
A. CUESTA-FERNÁNDEZ\*§, G. GALLASTEGUI¶,  
M. FERNÁNDEZ-GONZÁLEZ§ & A. GERDES||





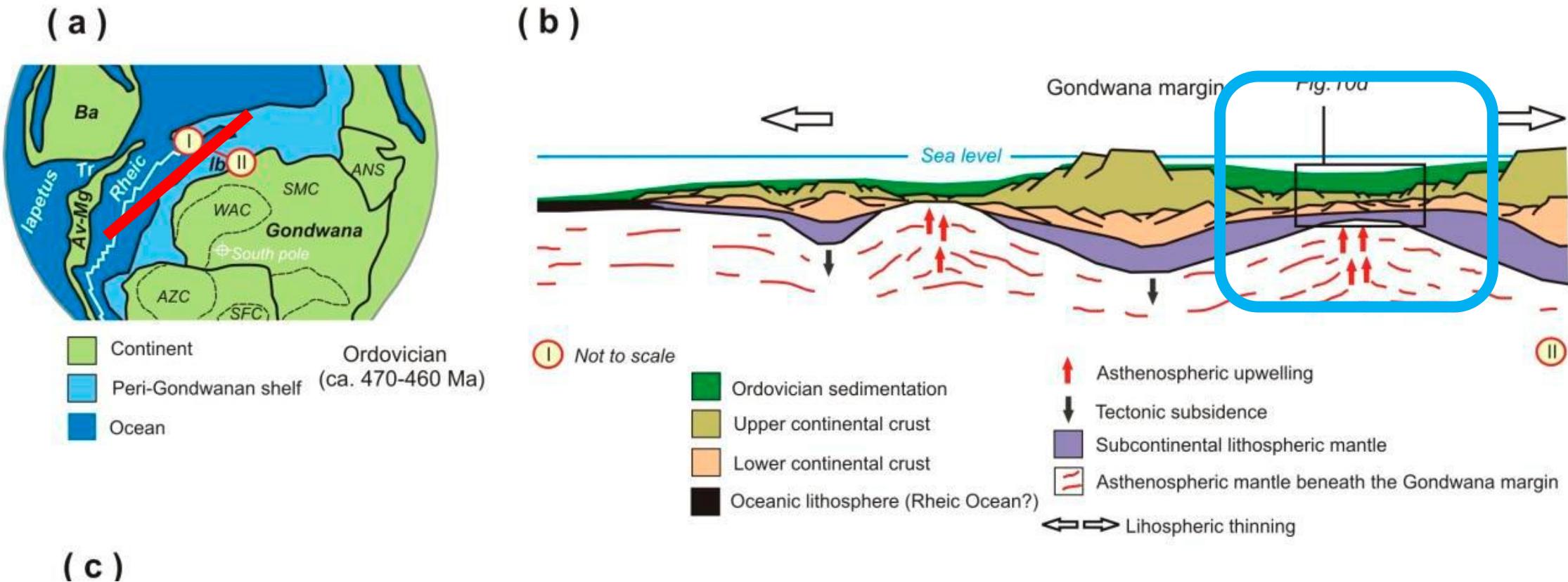
## Research Article

## Atypical peri-Gondwanan granodiorite-tonalite magmatism from Southern Iberia. Origin of magmas and implications

Antonio Castro <sup>a,b,\*</sup>, Manuel F. Pereira <sup>c</sup>, Carmen Rodríguez <sup>d</sup>, Carlos Fernández <sup>i</sup>



## Research Article

Atypical peri-Gondwanan granodiorite-tonalite magmatism  
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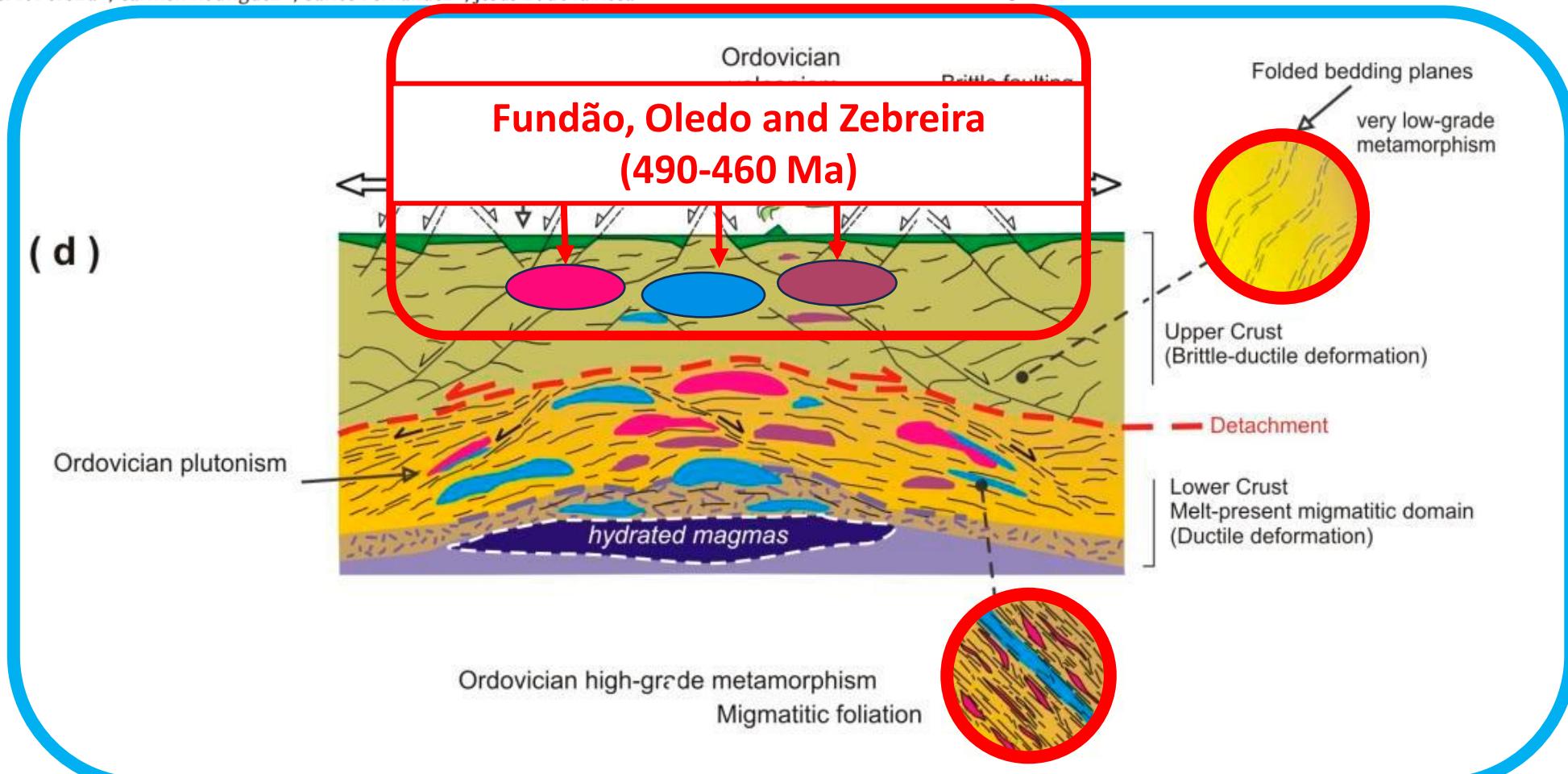
Research Article

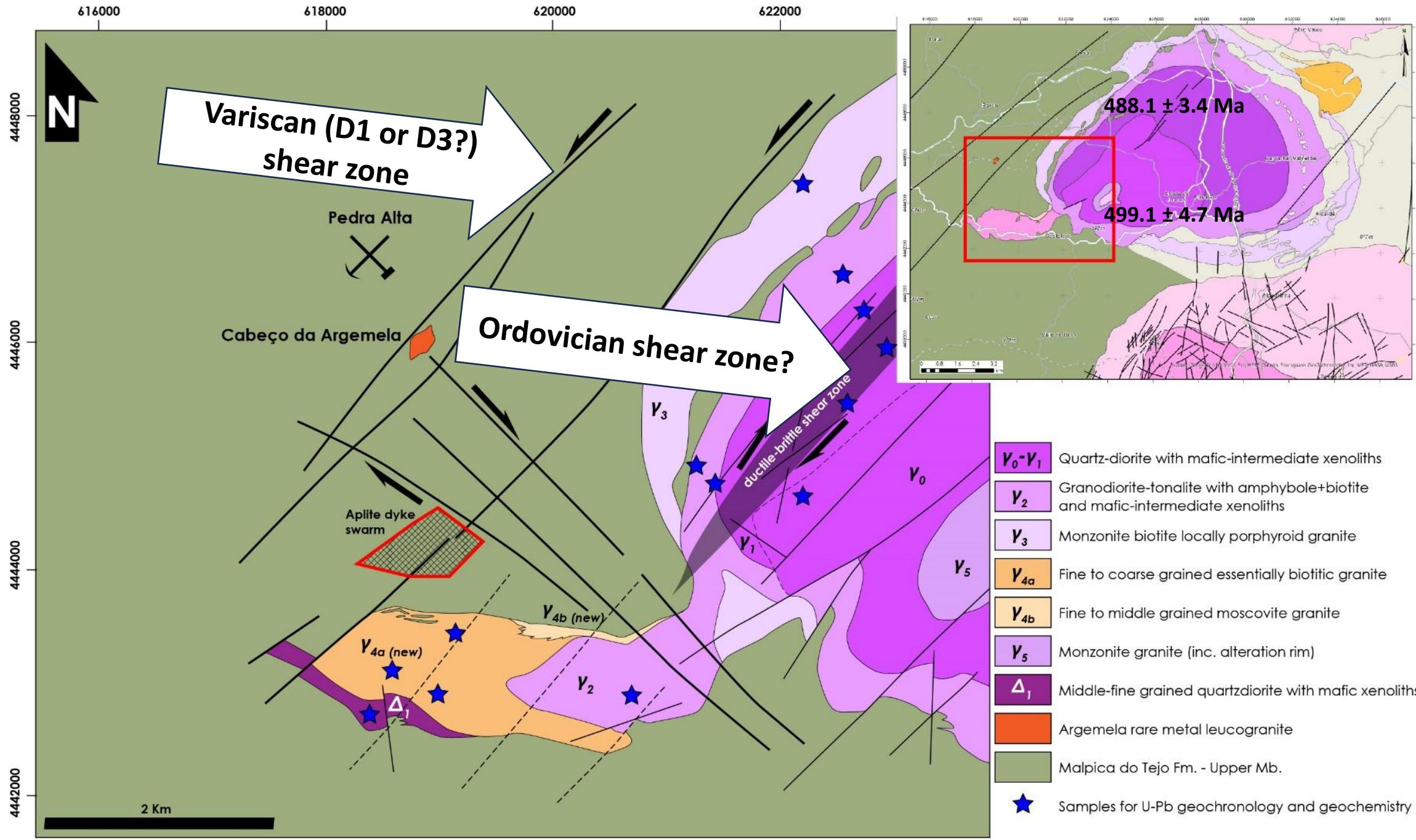
Atypical peri-Gondwanan granodiorite-tonalite magmatism  
from Southern Iberia. Origin of magmas and implications

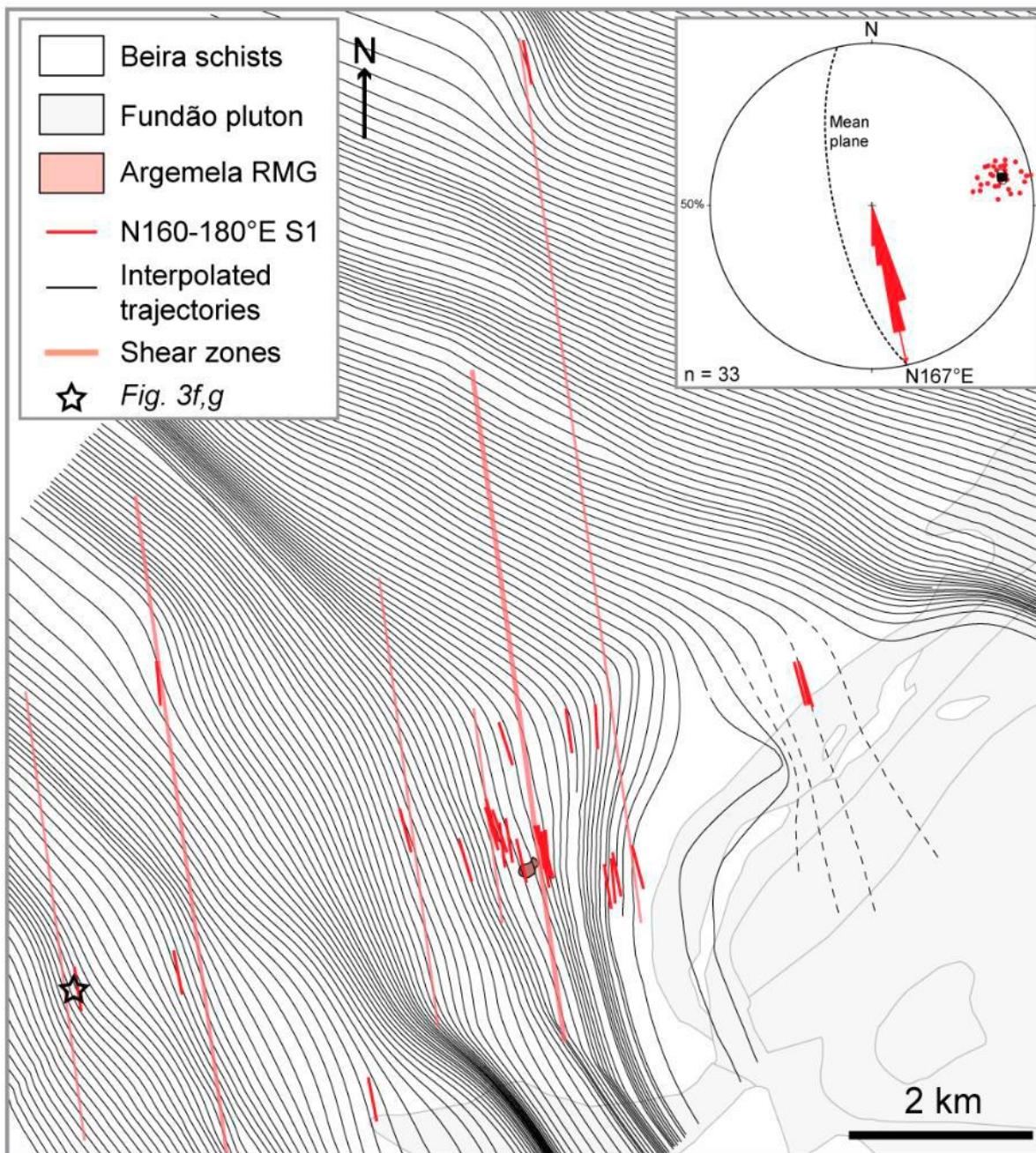


Antonio Castro <sup>a,b,\*</sup>, Manuel F. Pereira <sup>c</sup>, Carmen Rodríguez <sup>d</sup>, Carlos Fernández <sup>e</sup>, Jesús D. de la Rosa <sup>e</sup>

GPS strip

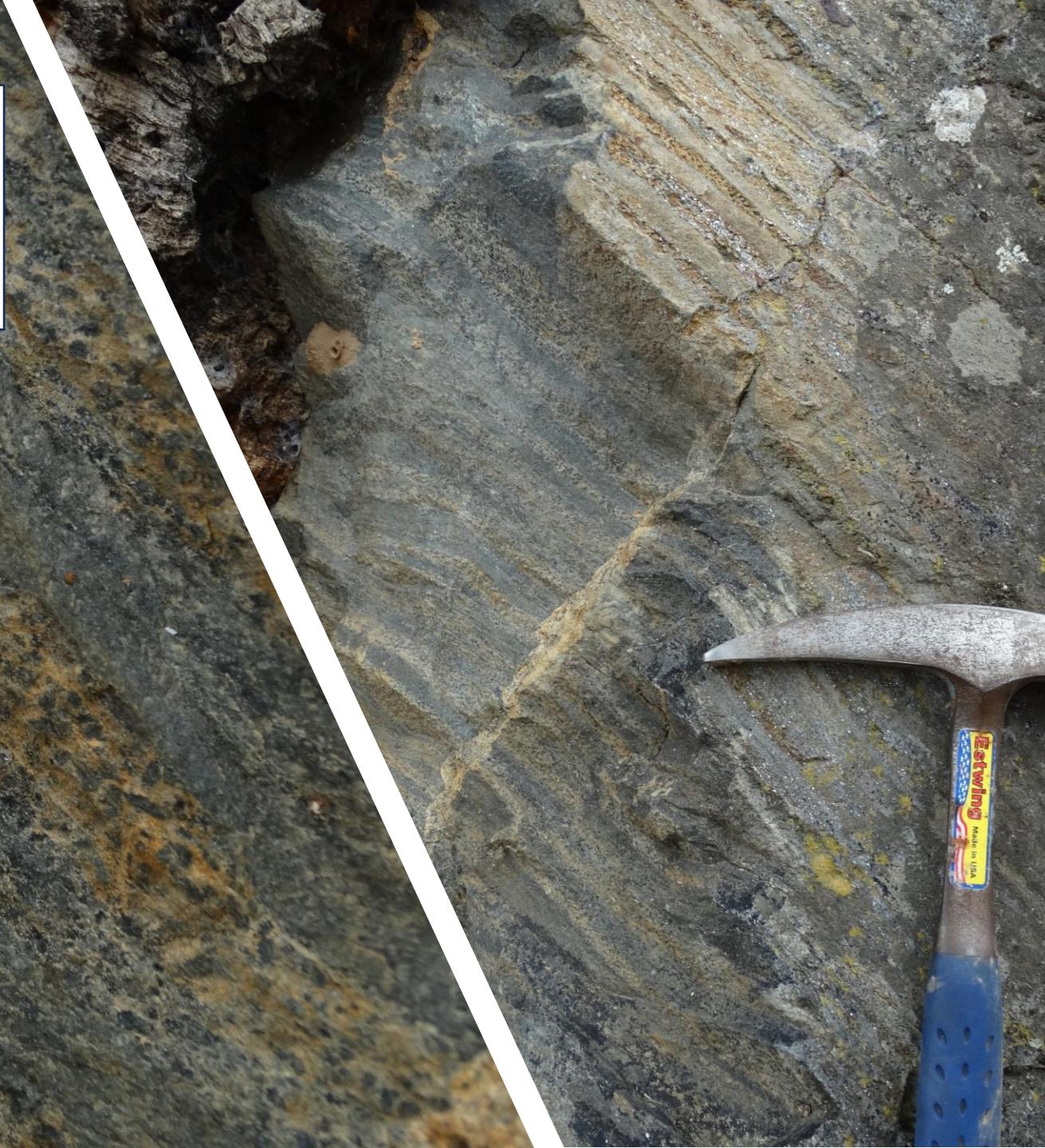




**b**

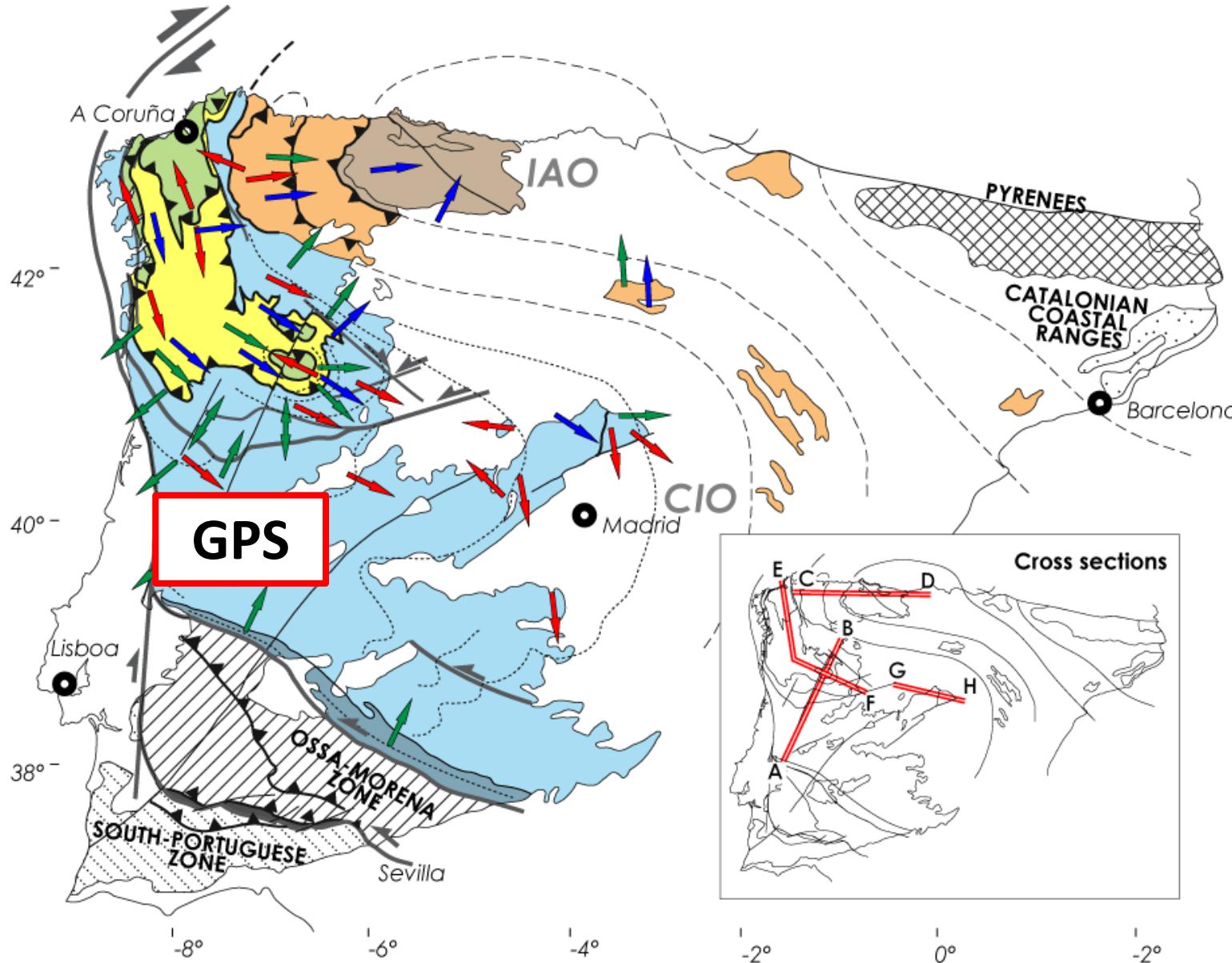
Michaud (2019, PhD)

Cadomian or Cambrian fabric?  
Overprinted by contact  
metamorphism of the Fundão  
pluton. The same is observed in  
Zebreira (480-470Ma)





# The Variscan continental collision



## Legend

**Galicia Trás-os-Montes Zone (GTMZ)**

- Upper, Middle and Lower Allochthon
- Parautochton

## Central Iberian Zone (CIZ)

- Northern and Southern domains
- Espiel Thrust Sheet

**West Asturo-Leonese Zone (WALZ)**

**Cantabrian Zone (CZ)**

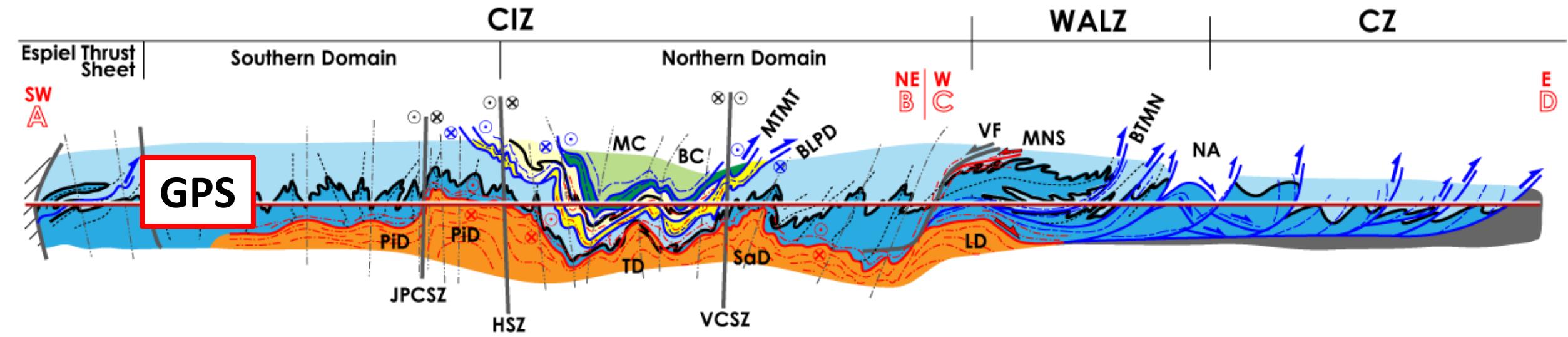
## Main structures

- C1 fold trace
- Zone boundary (hidden)
- Thrust zone
- Late-Variscan shear zones

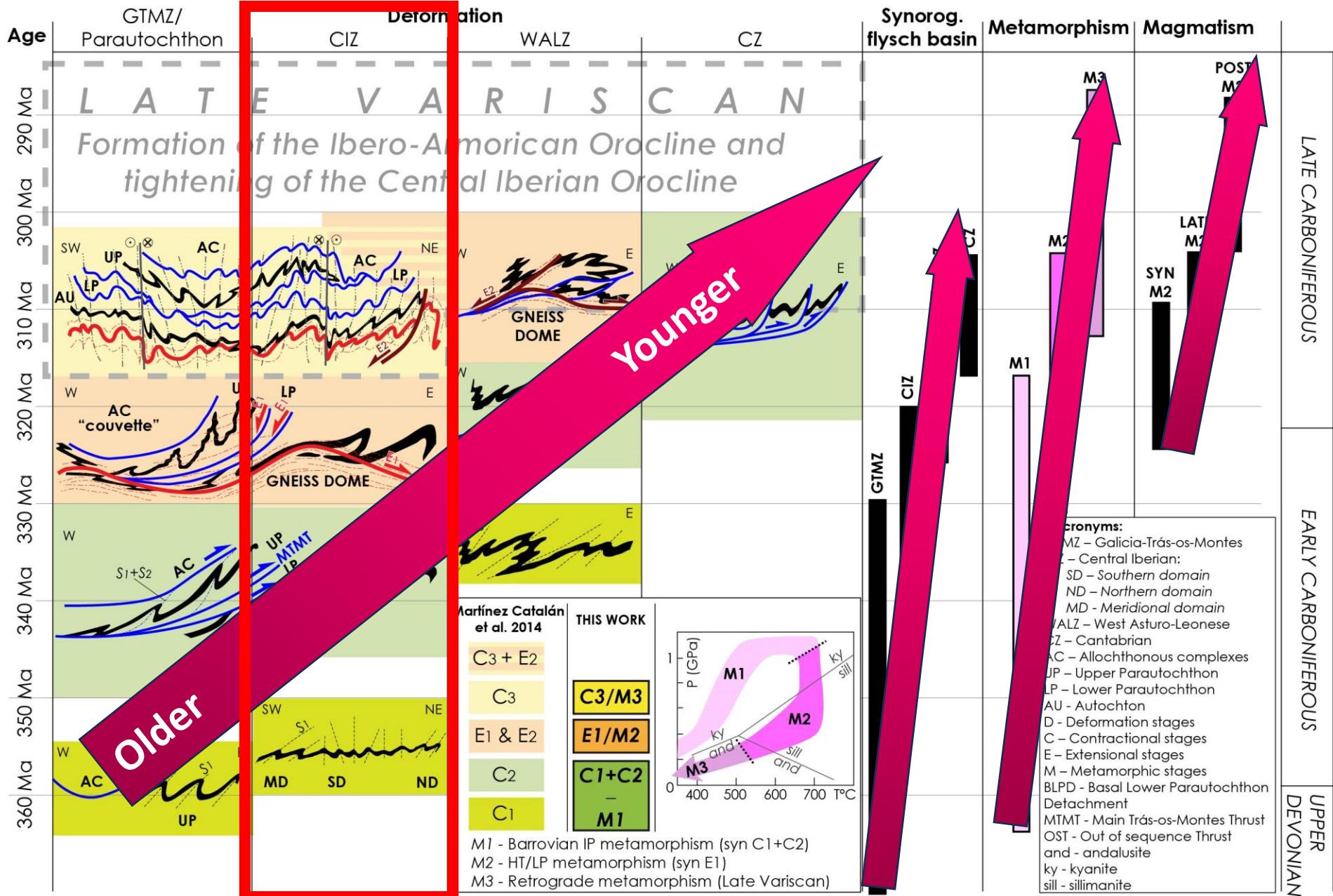
## Kinematics

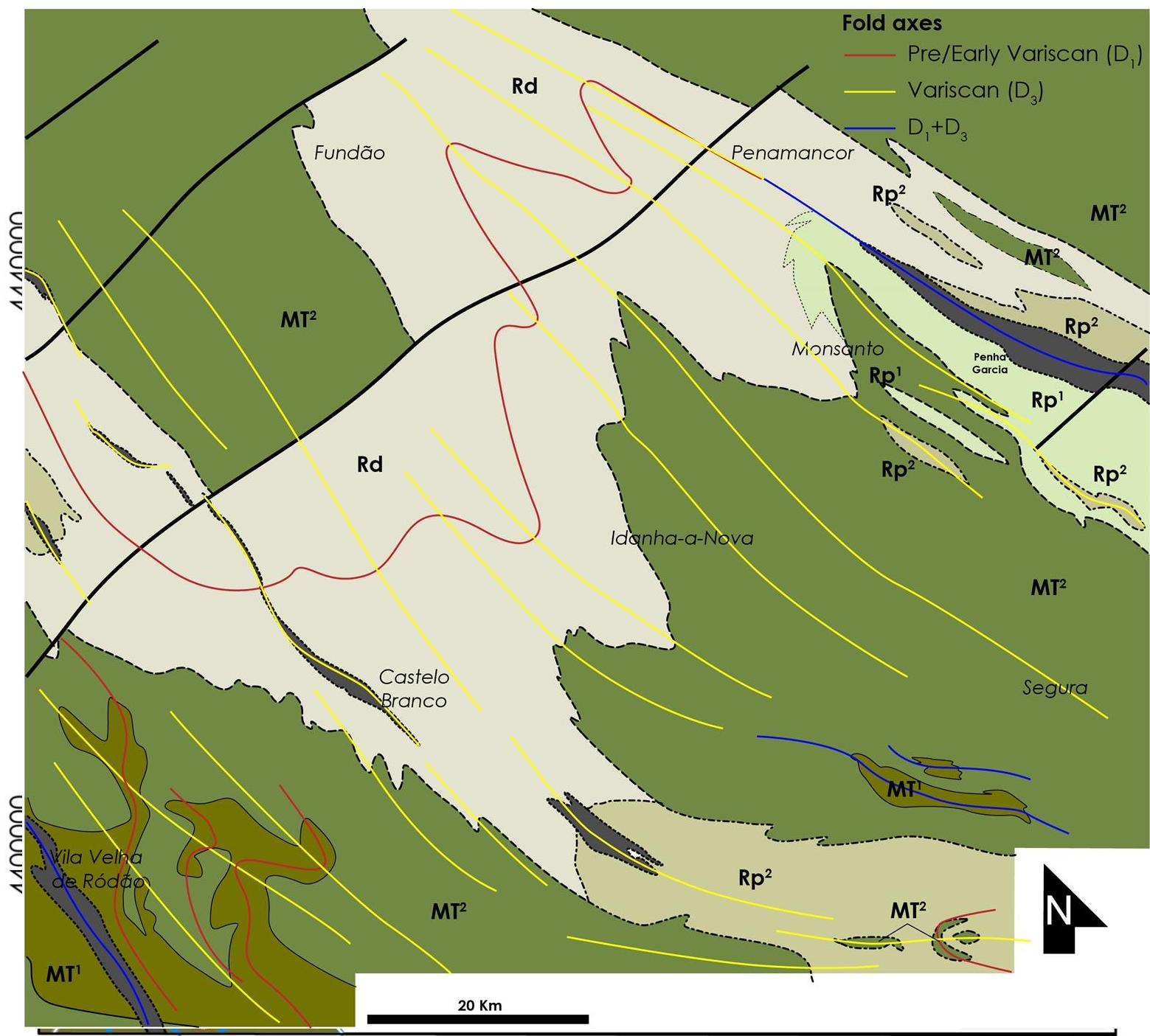
- Vergence of C1 folds
- C2 hanging-wall movement
- E1 hanging-wall movement

# The Variscan continental collision

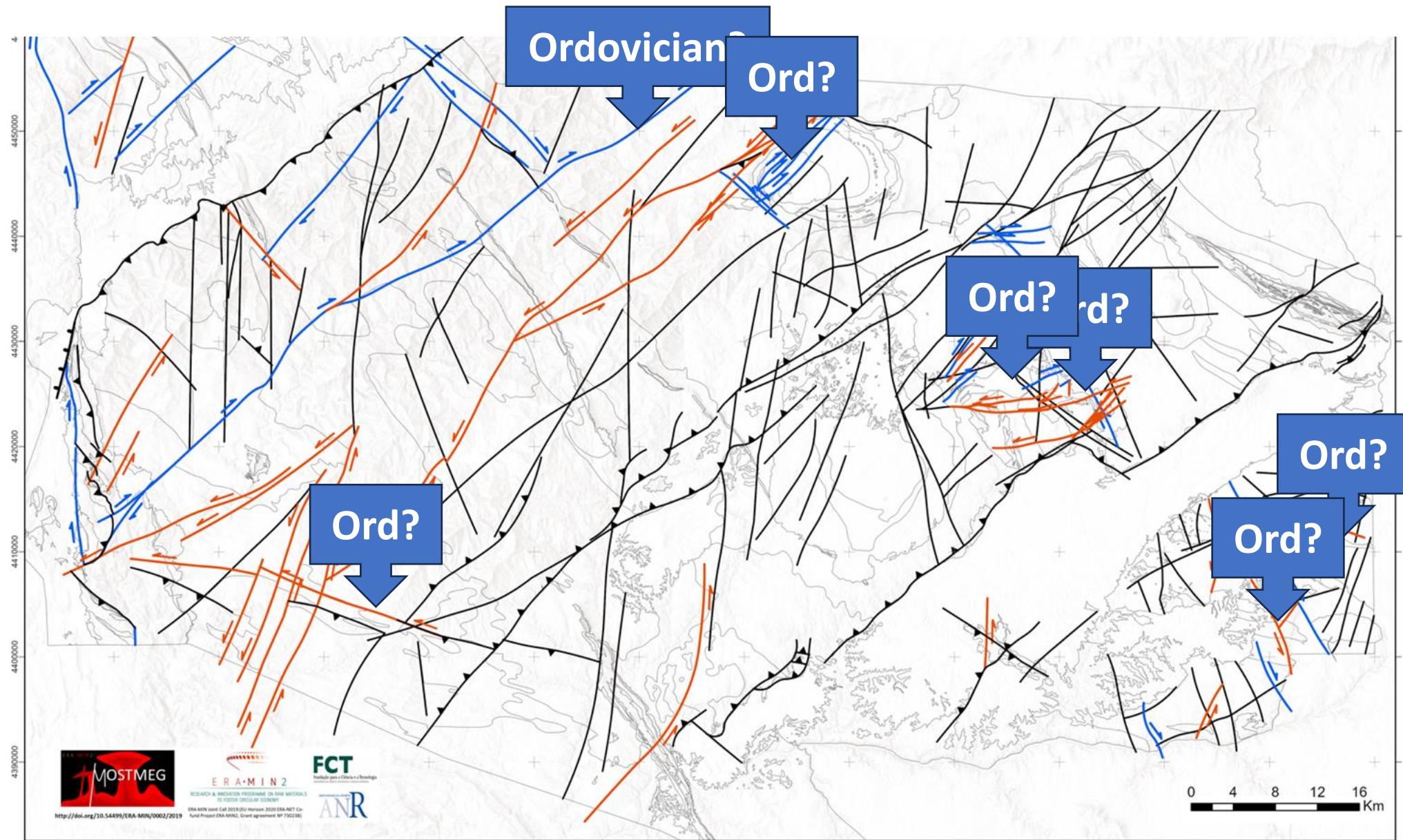


# The Variscan continental collision

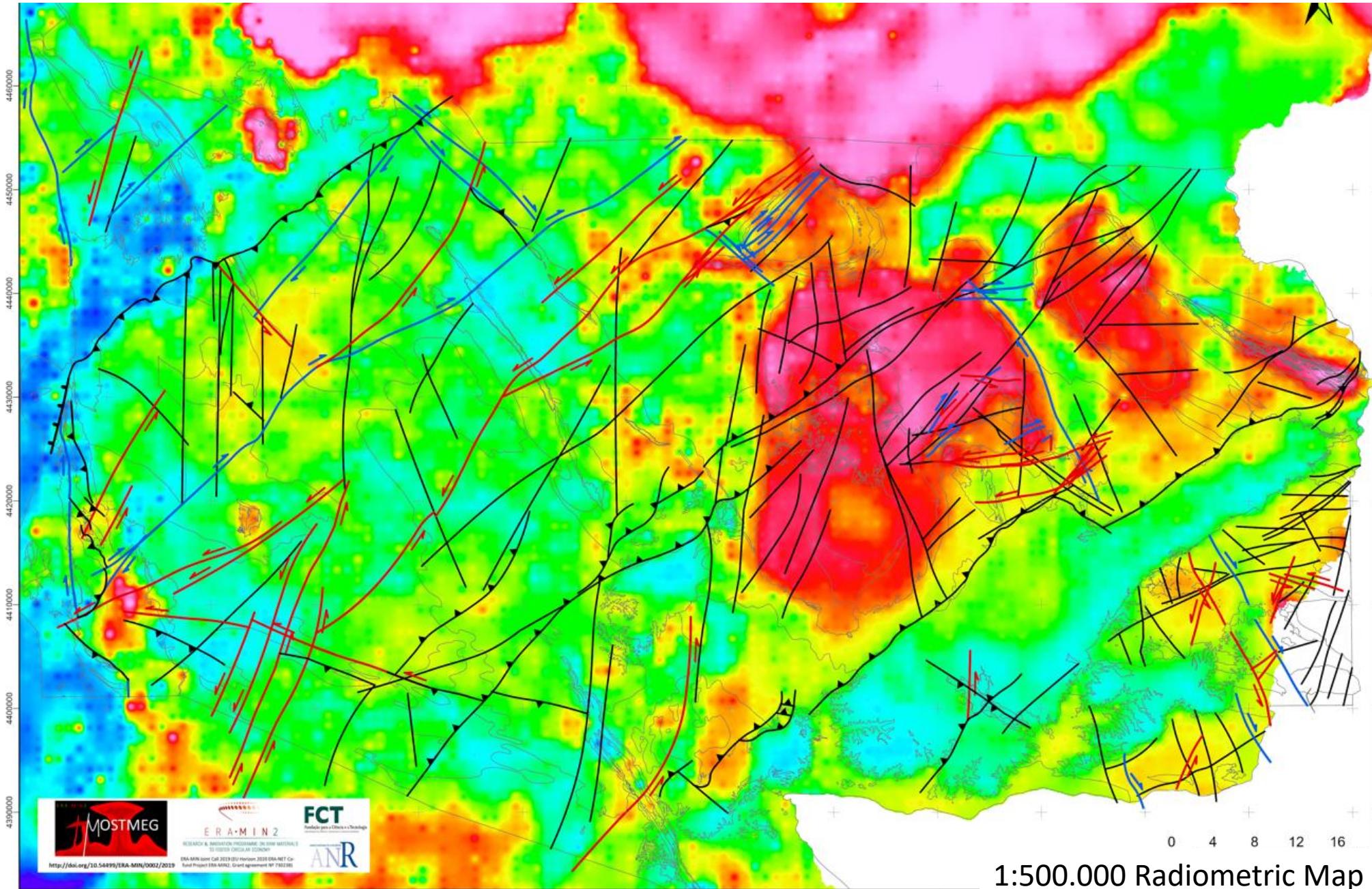




# Main Shear Zones

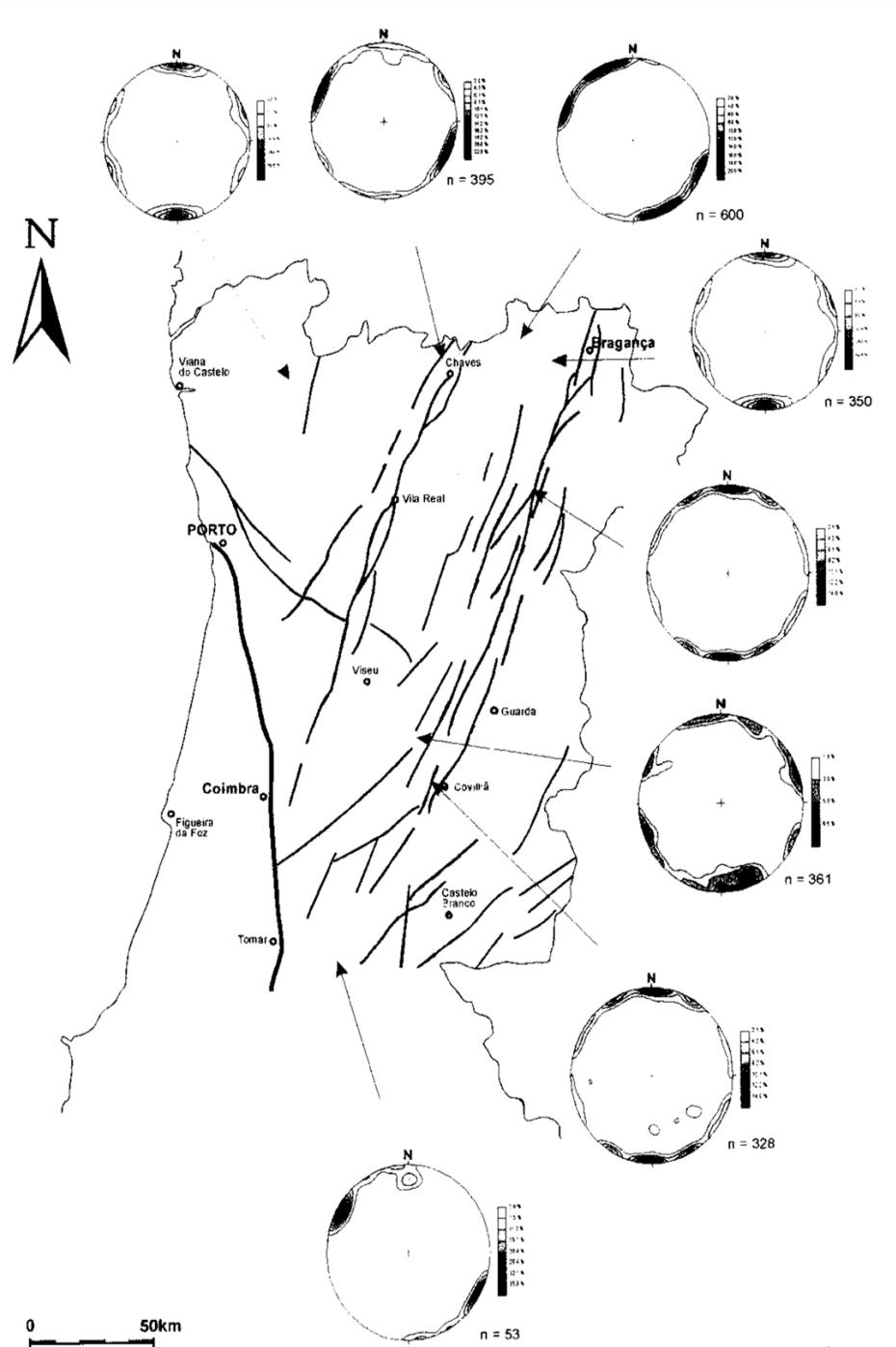


# Shear zones | could they influence the rising/emplacement of orogenic silicate melts?



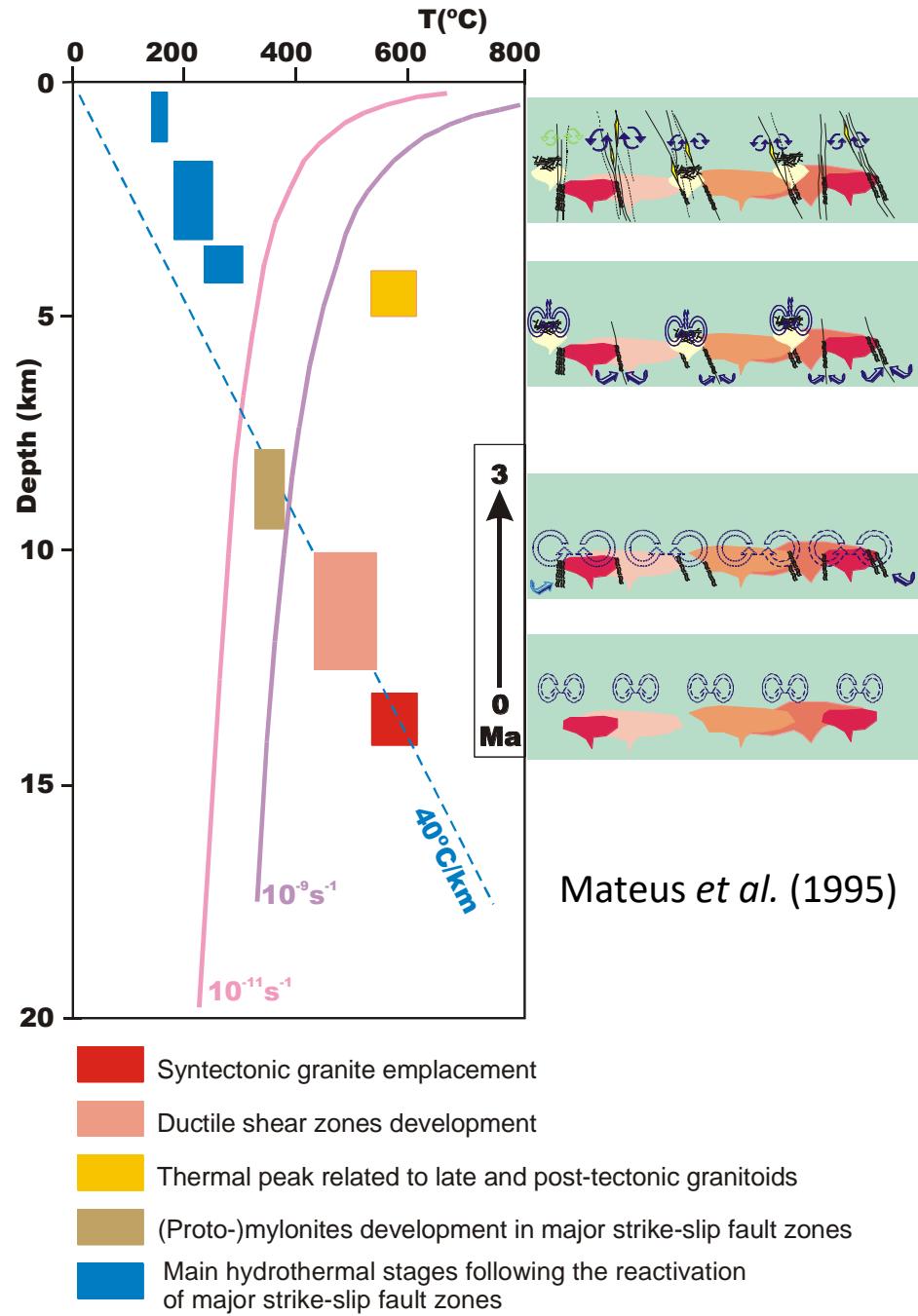
# The Late-Variscan strike-slip fault network

*an important fluid circulation  
paleosystem*

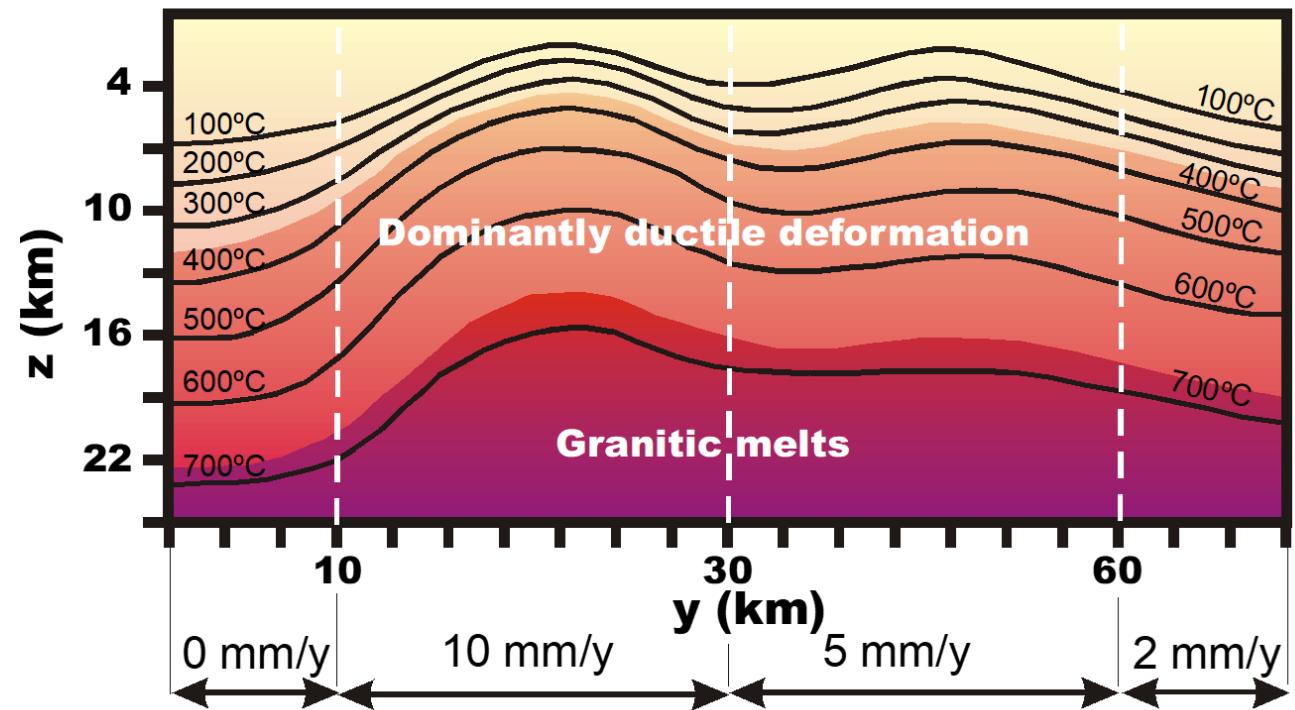


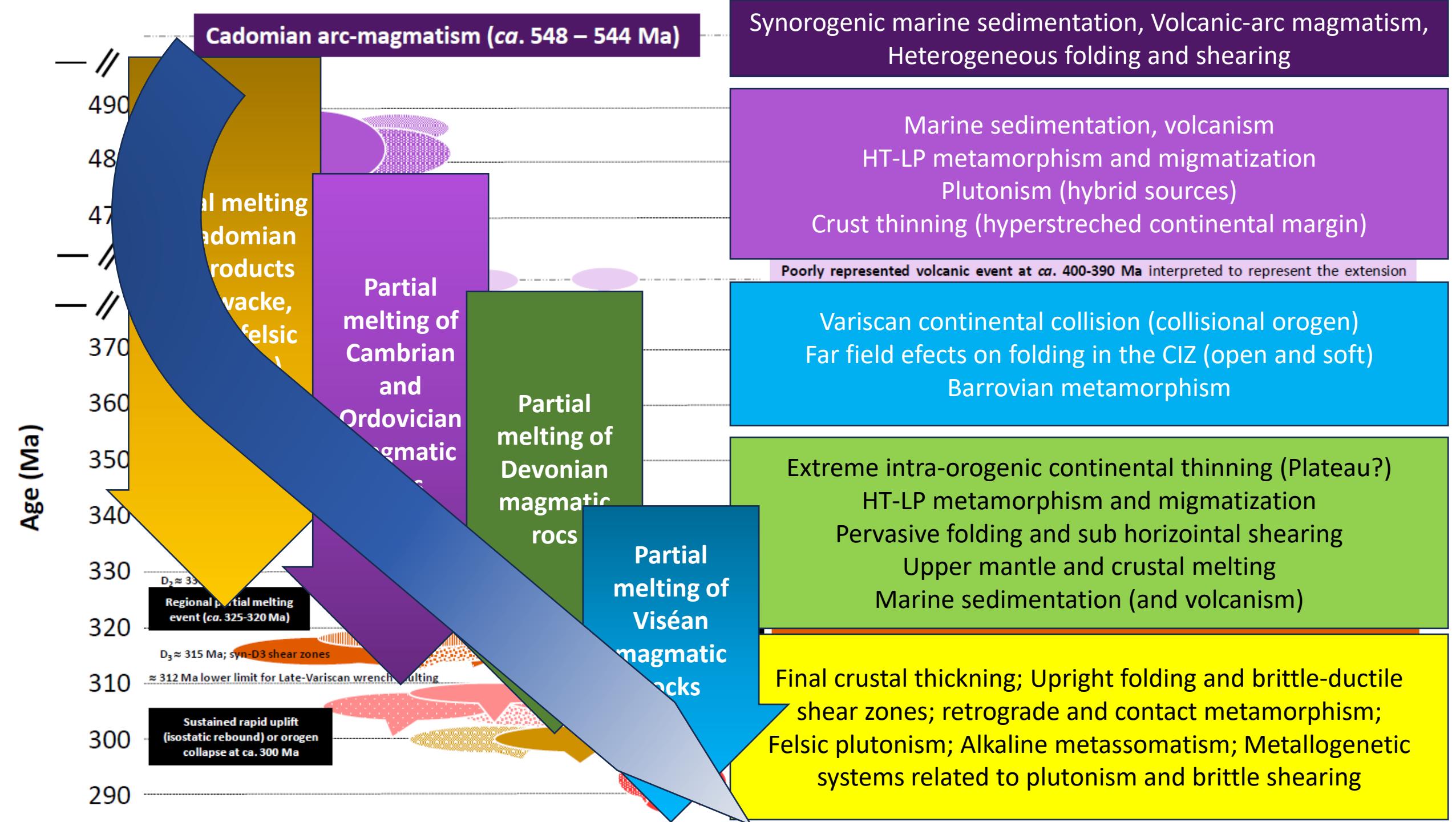
*in Marques et al. (2001)*





**Composite 2D heat diagram, considering different uplift rates from W to E and  $t = 3$  Ma**







<https://mostmeg.rd.ciencias.ulisboa.pt/>

**What is the implication of the Variscan crustal architecture in the dispersion of targets in the Gois-Panasqueira-Gois belt?**

**Stay sharp in the next fantastic MOSTMEG presentations!**

**Thank you for your attention!**

**Fortunately, this will get a lot better!**

*Ribeira de  
Ceife*