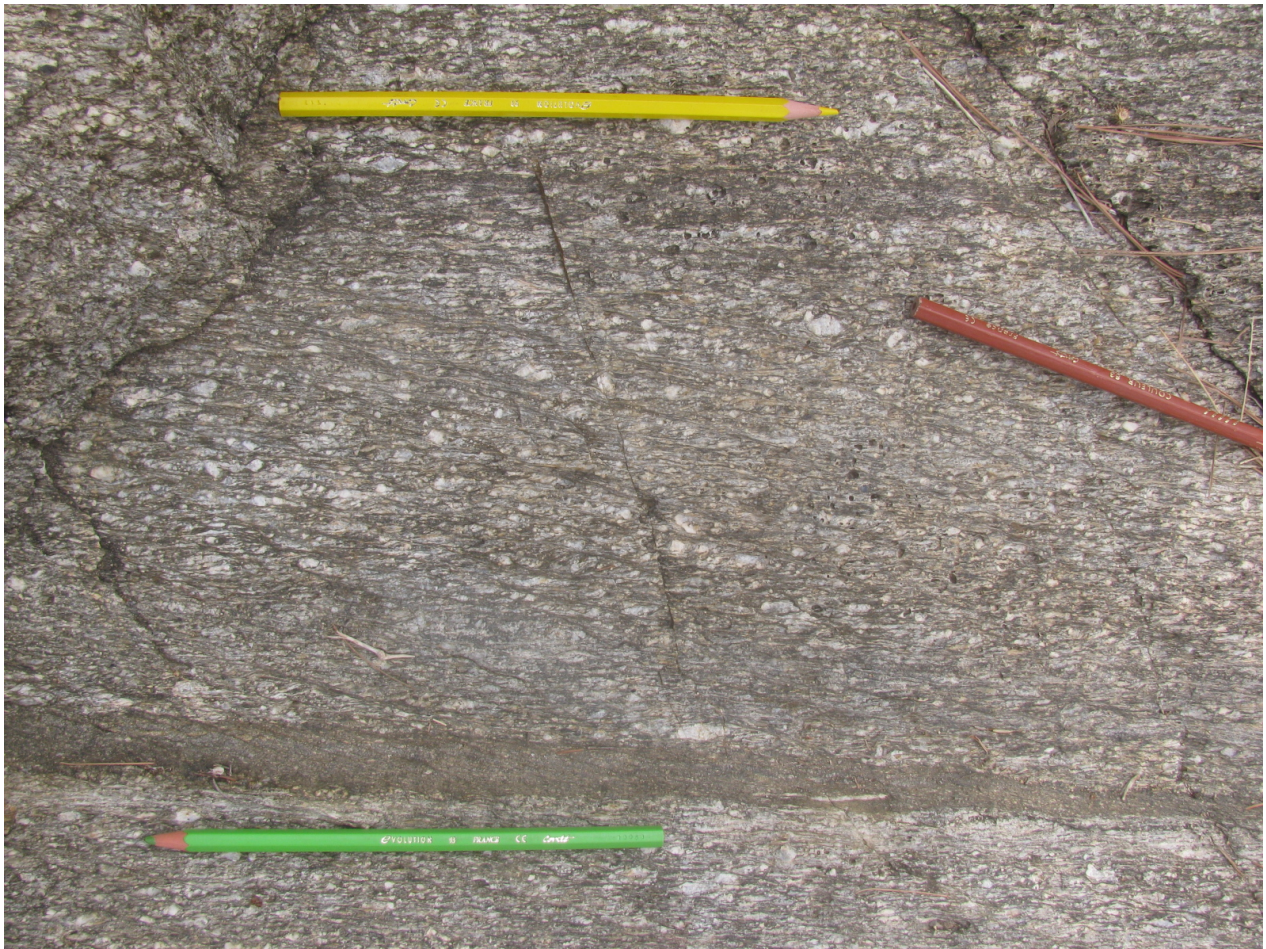
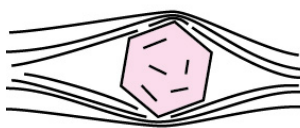




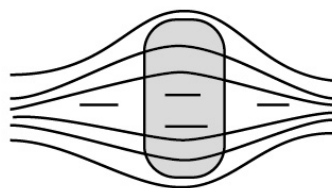
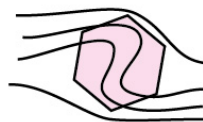
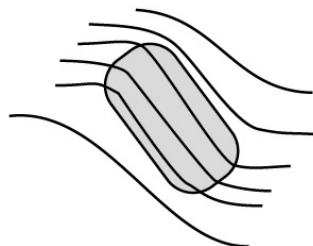


ANTÉ-déformation	SYN-déformation	POST-déformation
A glaucophanes anté-S2, actinolites syn-S2 <i>schiste bleu</i>	C <i>grenat hélicitique</i>	E <i>micaschiste à chloritoïde</i> schistosité micro-plissée incorporée lors de la croissance des porphyroblastes de chloritoïde
B <i>gneiss œillé</i> porphyroclastes de feldspaths, fluage du quartz (o.p. = ombre de pression)	D <i>schiste à disthène et staurotide</i> micas, staurotides et disthène, non déformés forment la foliation	F <i>schiste à andalousite</i>

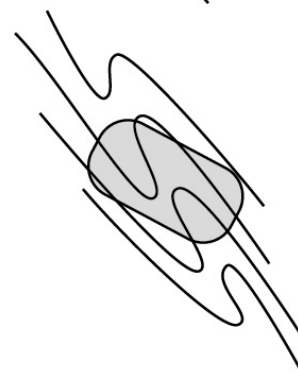
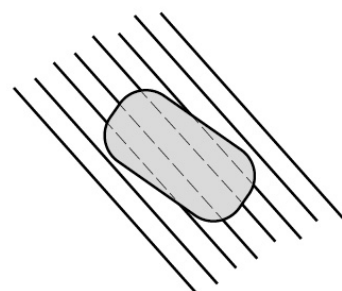
X ANTE-DEFORMAT°

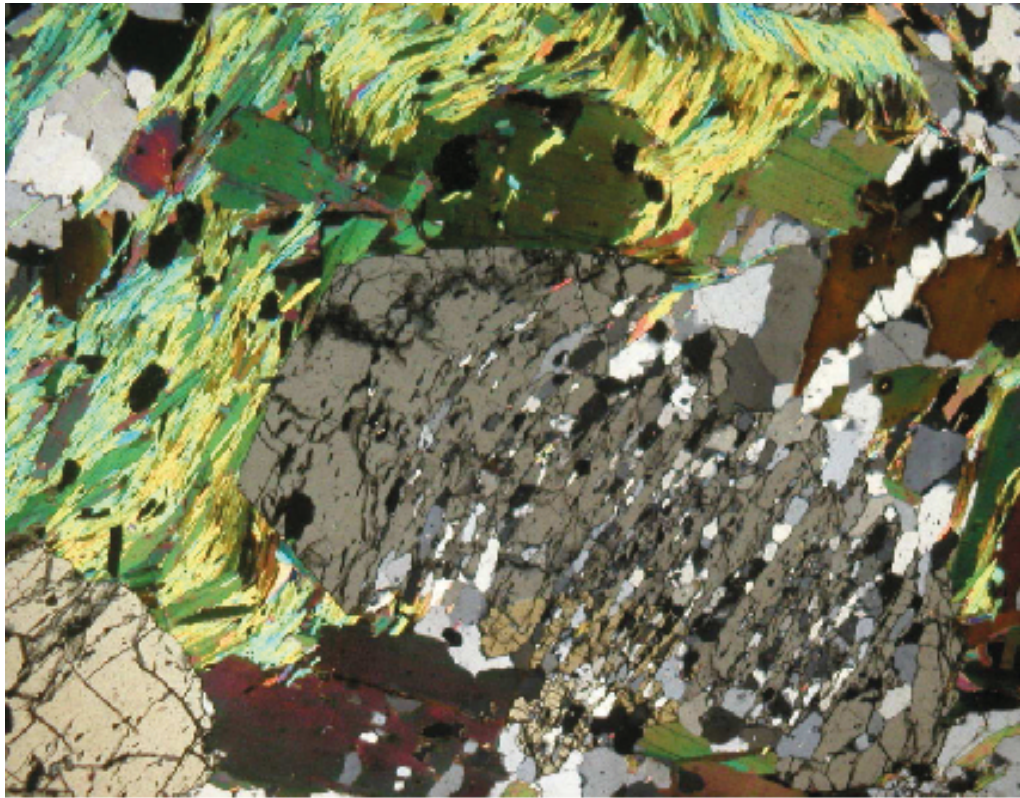


X SYN-DEFORMAT°

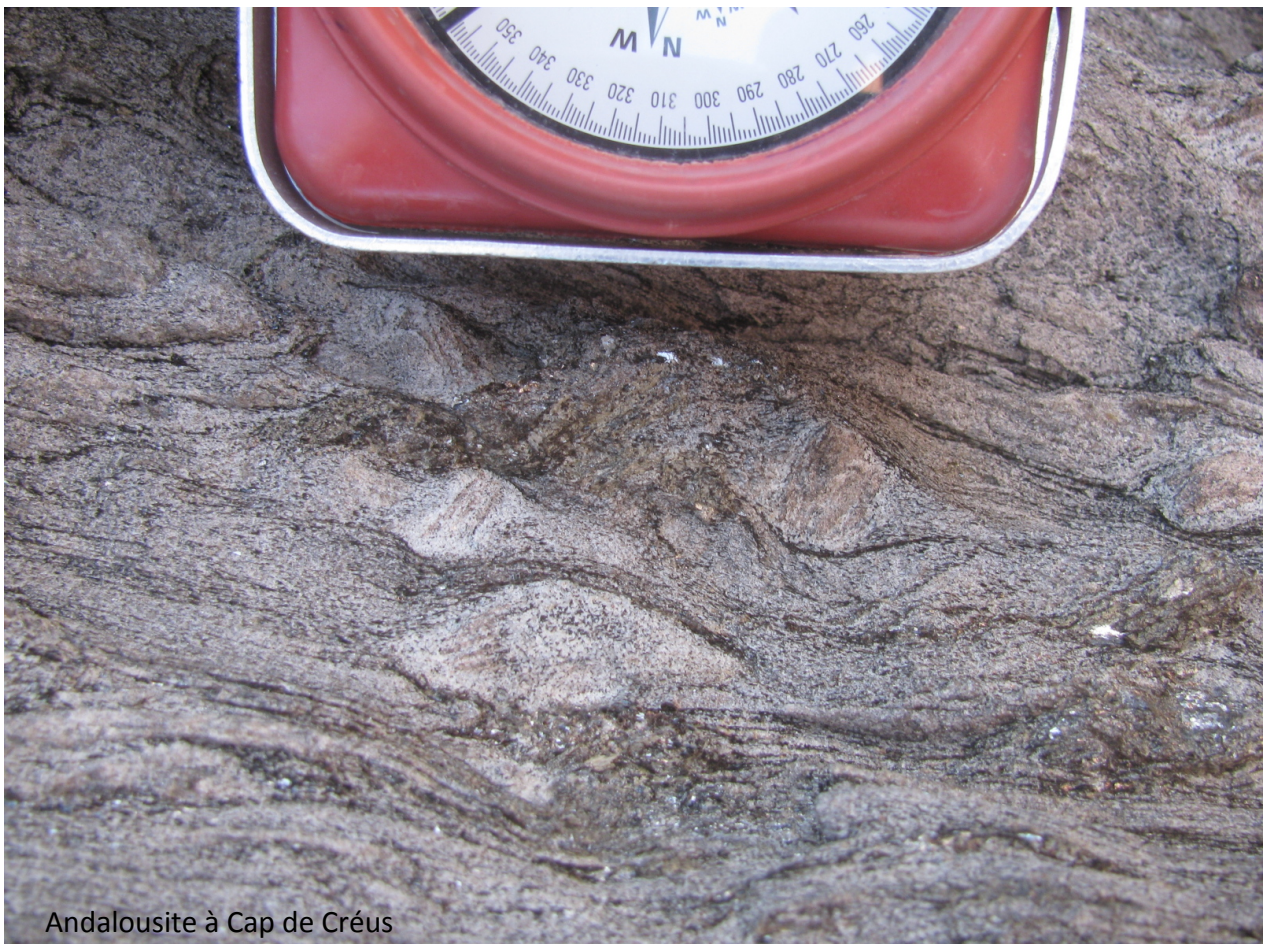


X POST-DEFORMAT°





Staurotide recoupant minéraux foliés



Andalousite à Cap de Créus

LINEATION MAP OF THE MAQSAD AREA

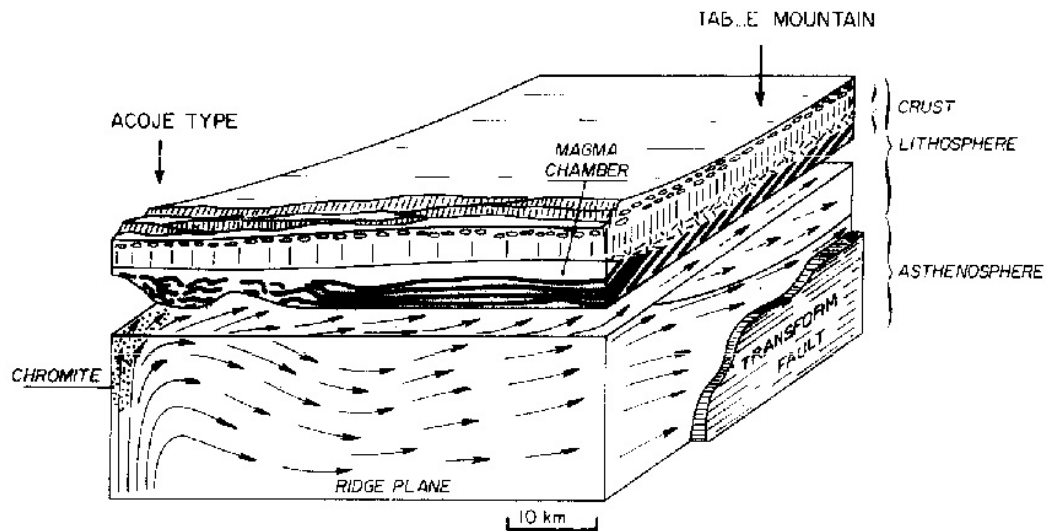
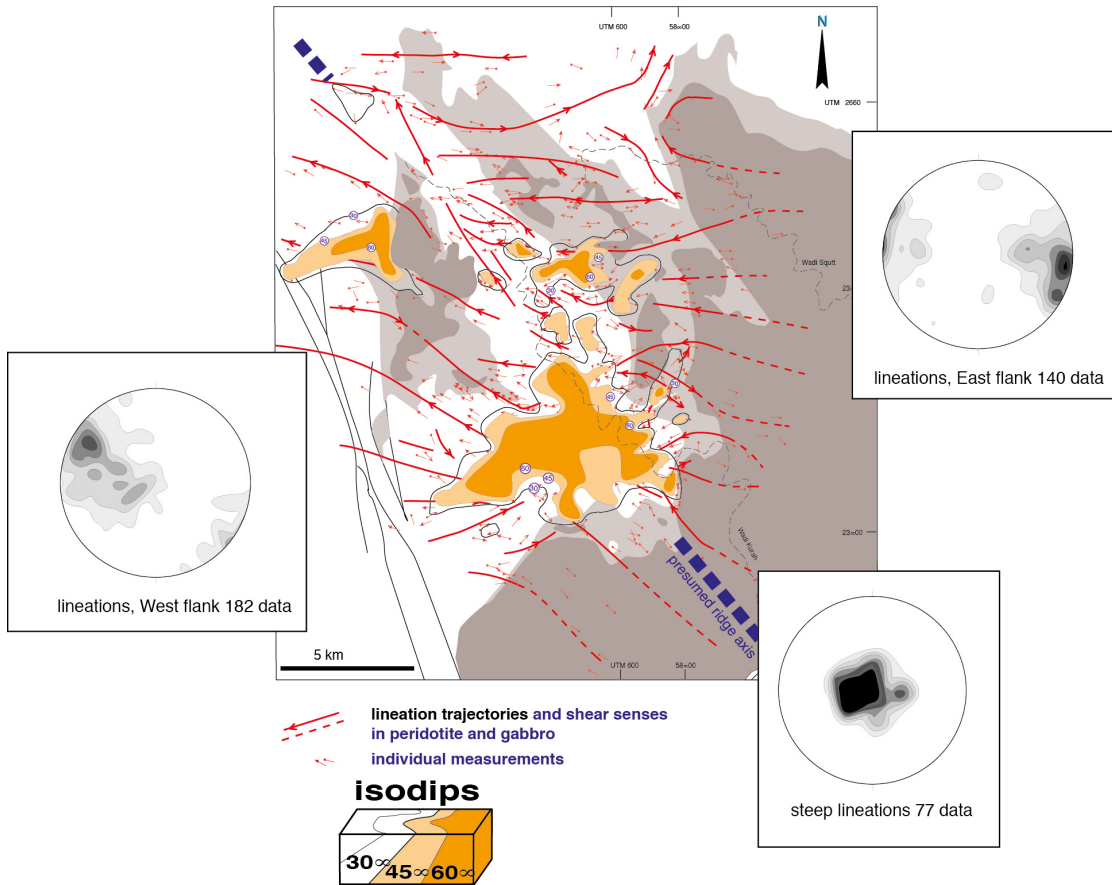
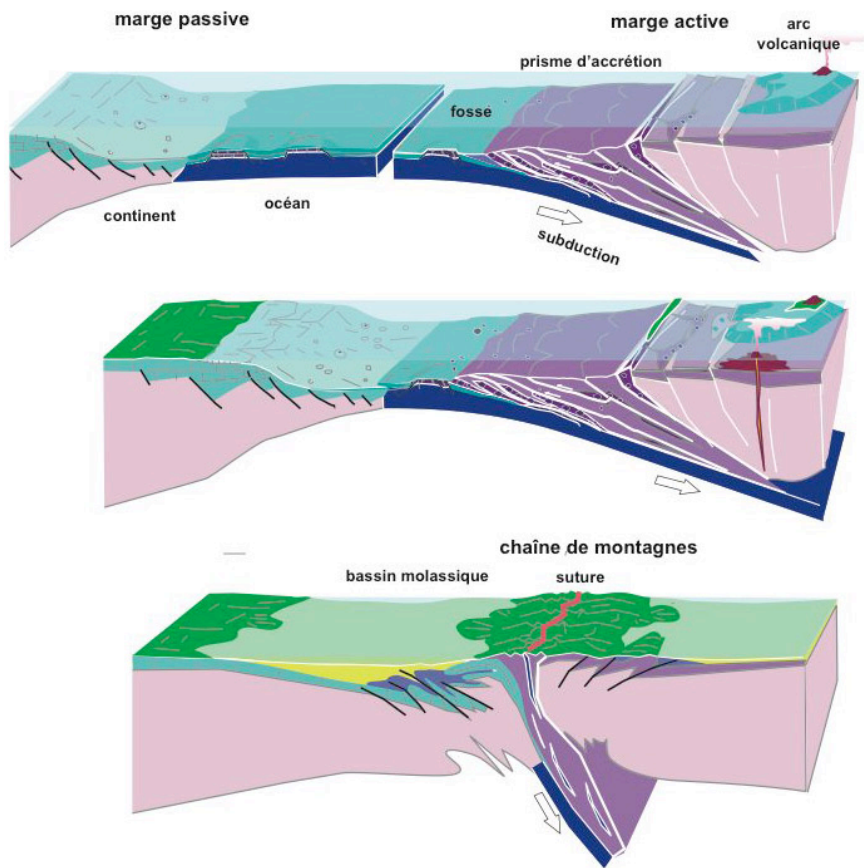
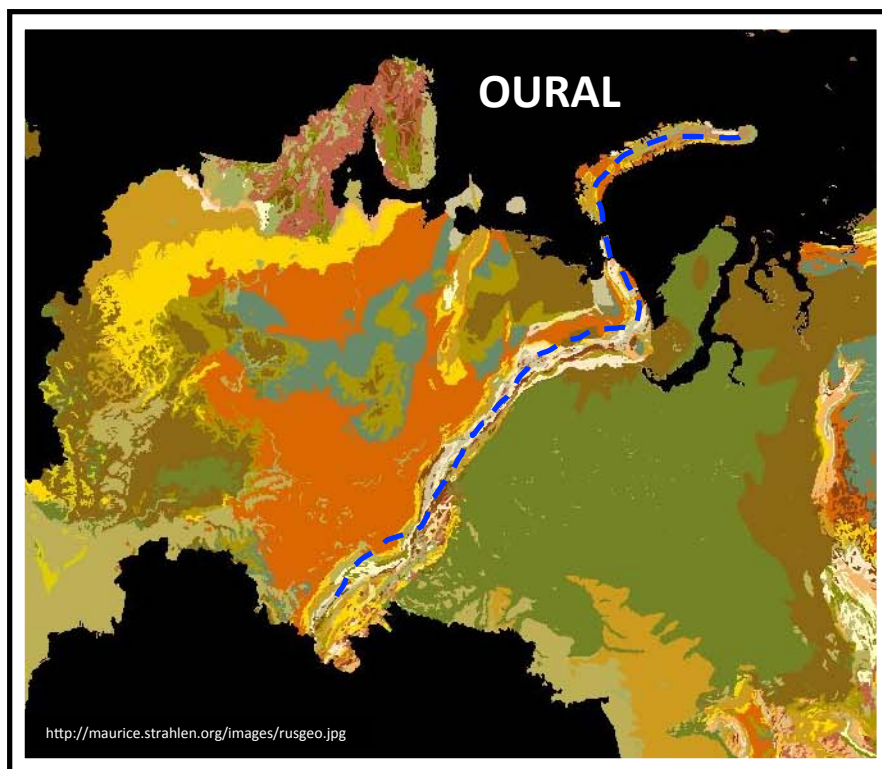
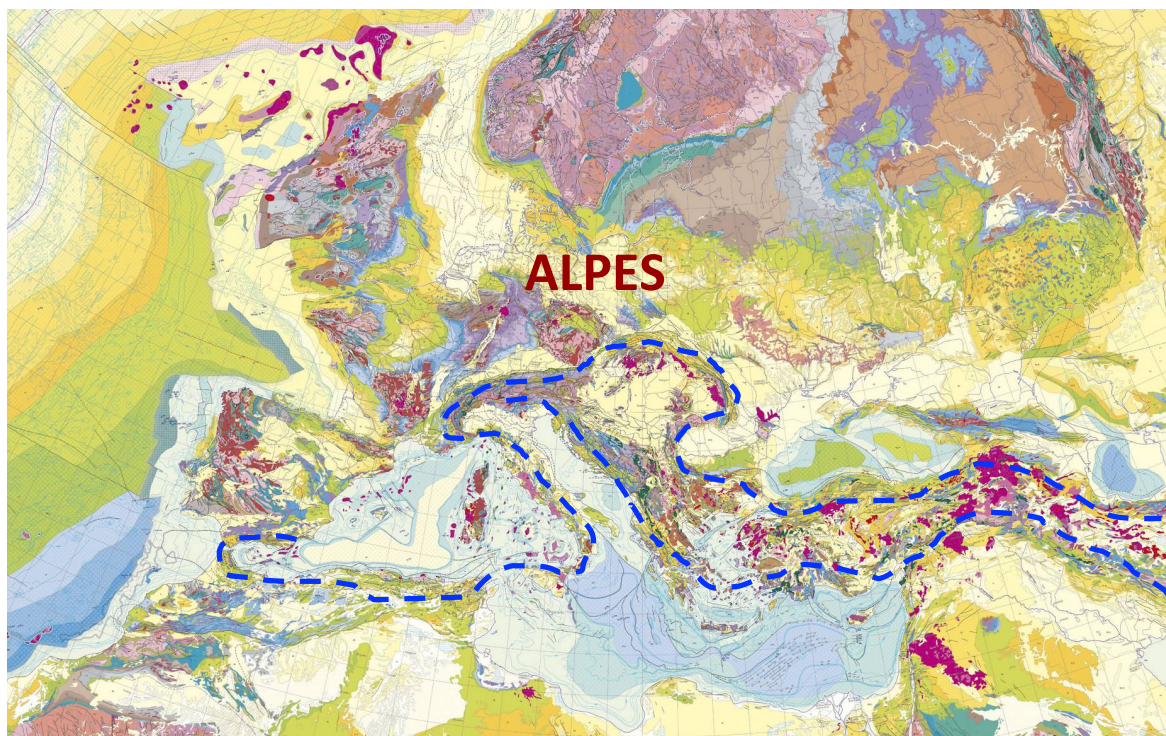


Fig. 7. Ridge model resulting from local uprising of mantle flow (Acoje type) followed by horizontal divergence and progressive channelling by transform faults (Table Mountain type). Full arrows: flow line in the mantle (asthenosphere); dashed arrows: fossil flow line (lithosphere); thick lines: accumulation plane in gabbros; dashes: isotropic gabbros; vertical lines: dike swarm; ellipses: volcanics.

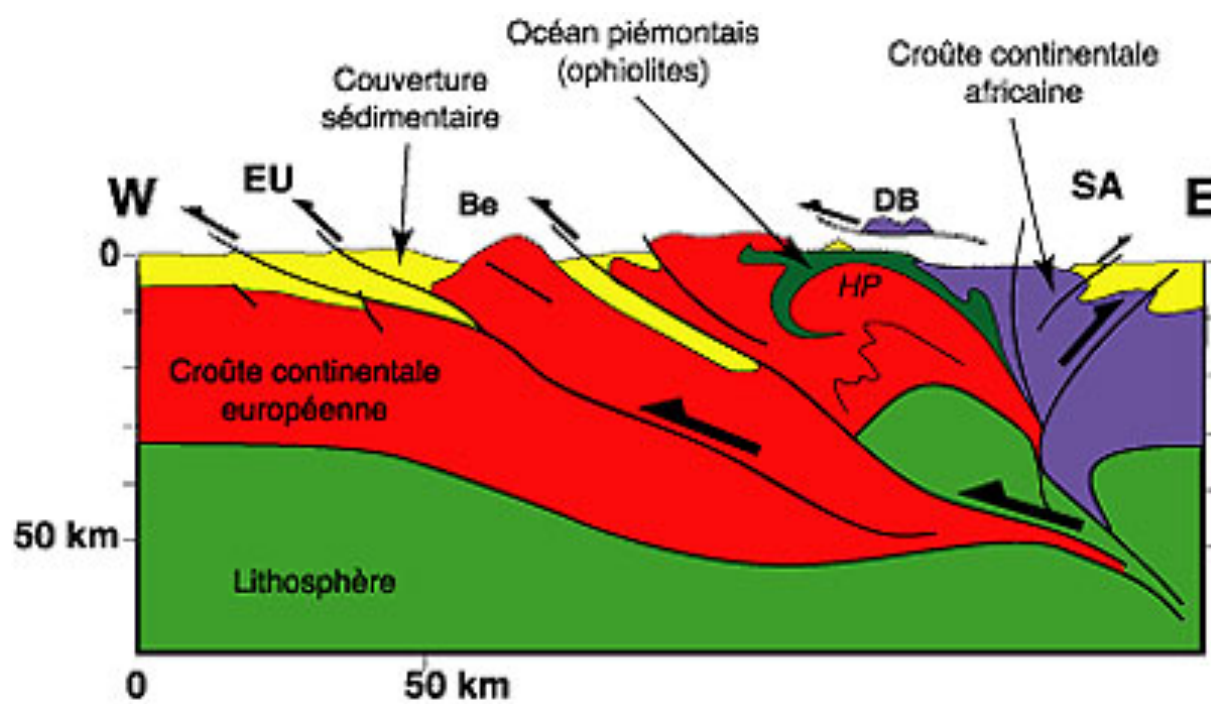


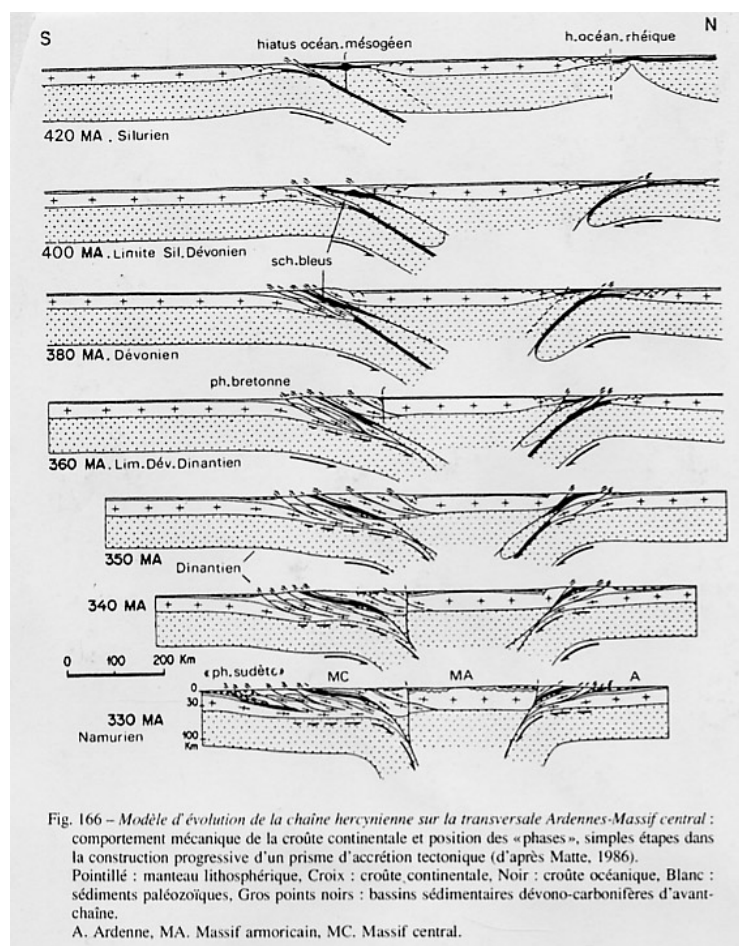
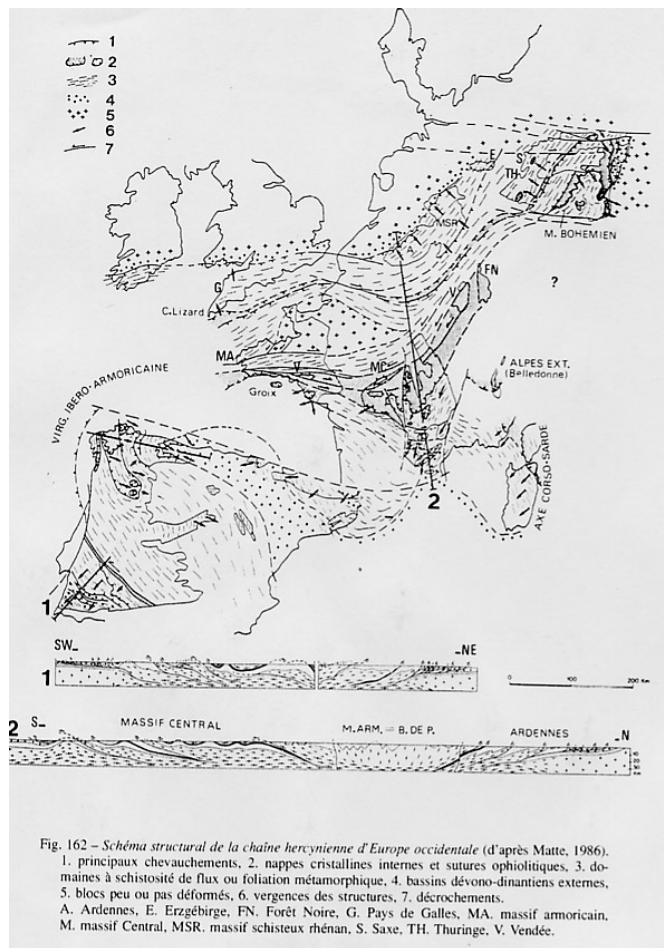
Orogènes récents / Orogènes anciens





P. Barbey - Fév. 2012





La croûte précambrienne

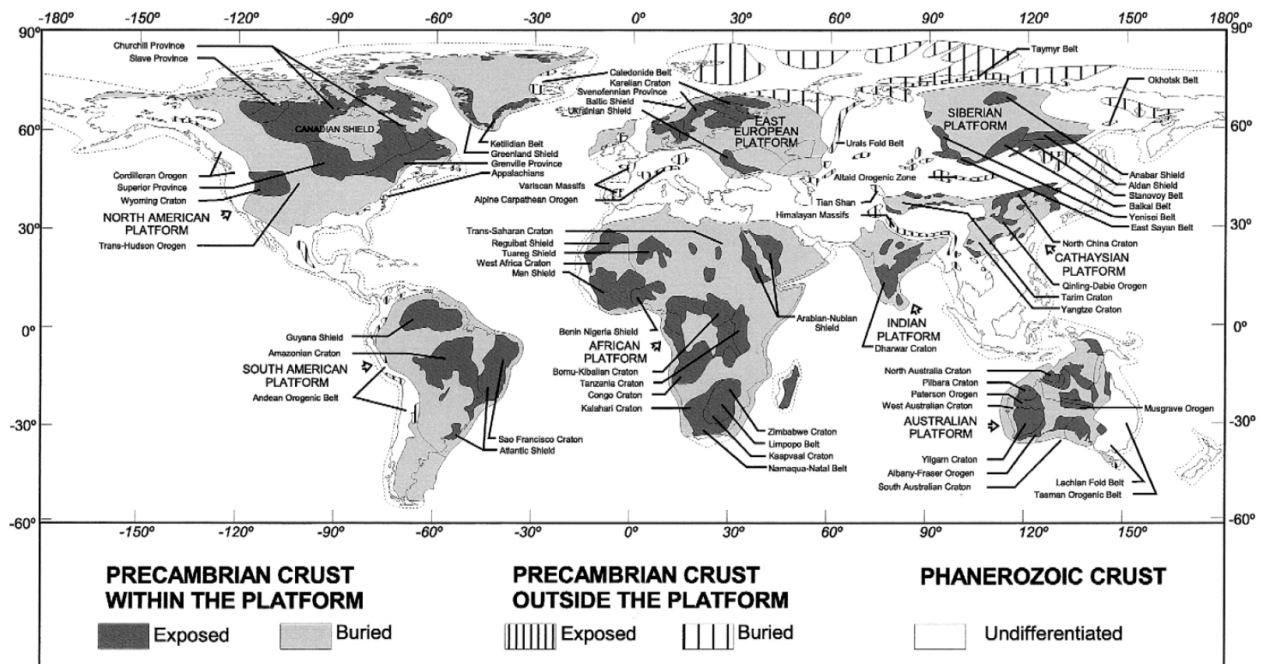
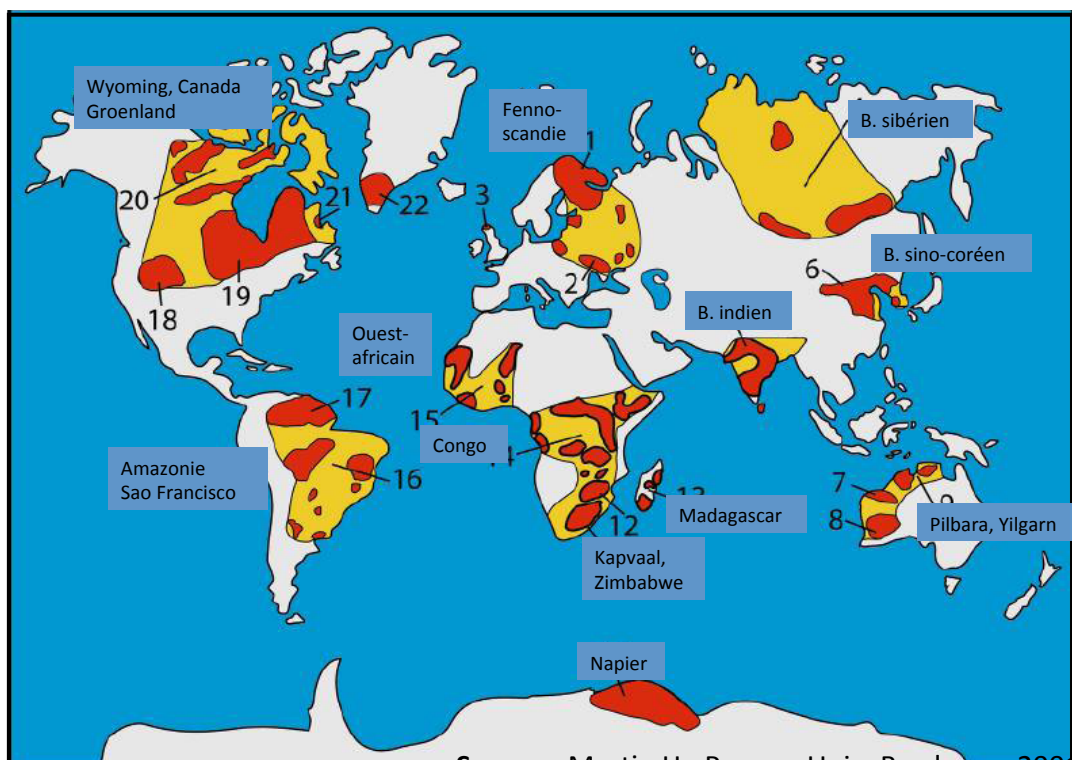


Fig. 1. Distribution of Precambrian cratons and shields, and Phanerozoic mobile belts.

(Goldfarb et al, 2001)

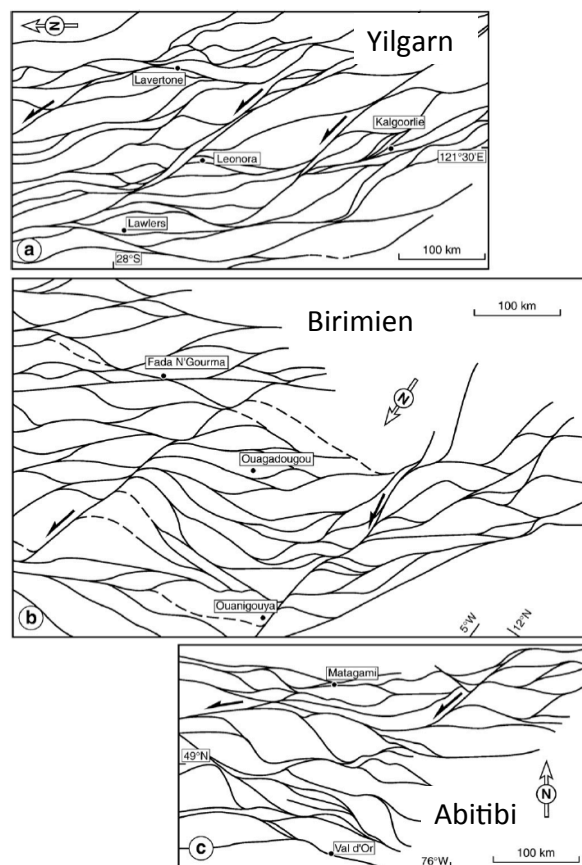
La croûte archéenne



Source : Martin H., Presses Univ. Bordeaux, 2001



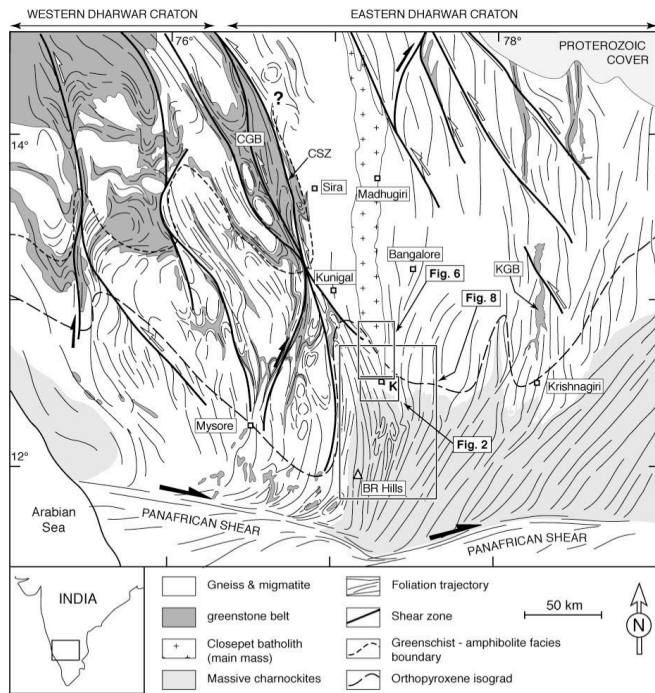
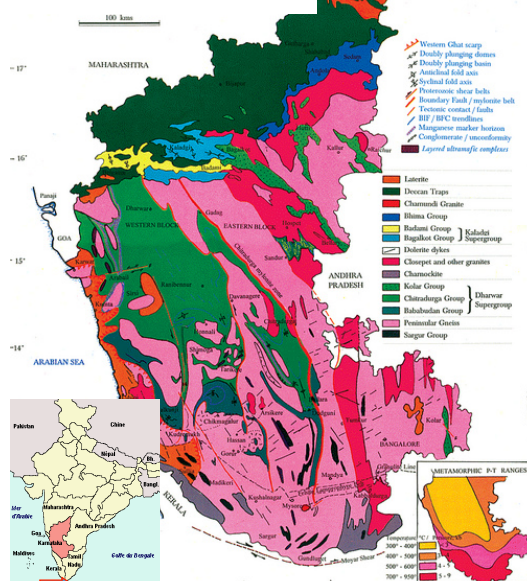
P. Barbey - Fév. 2012



P. Barbey - Fév. 2012

Source : Chardon et al, 2009, Tectonophysics

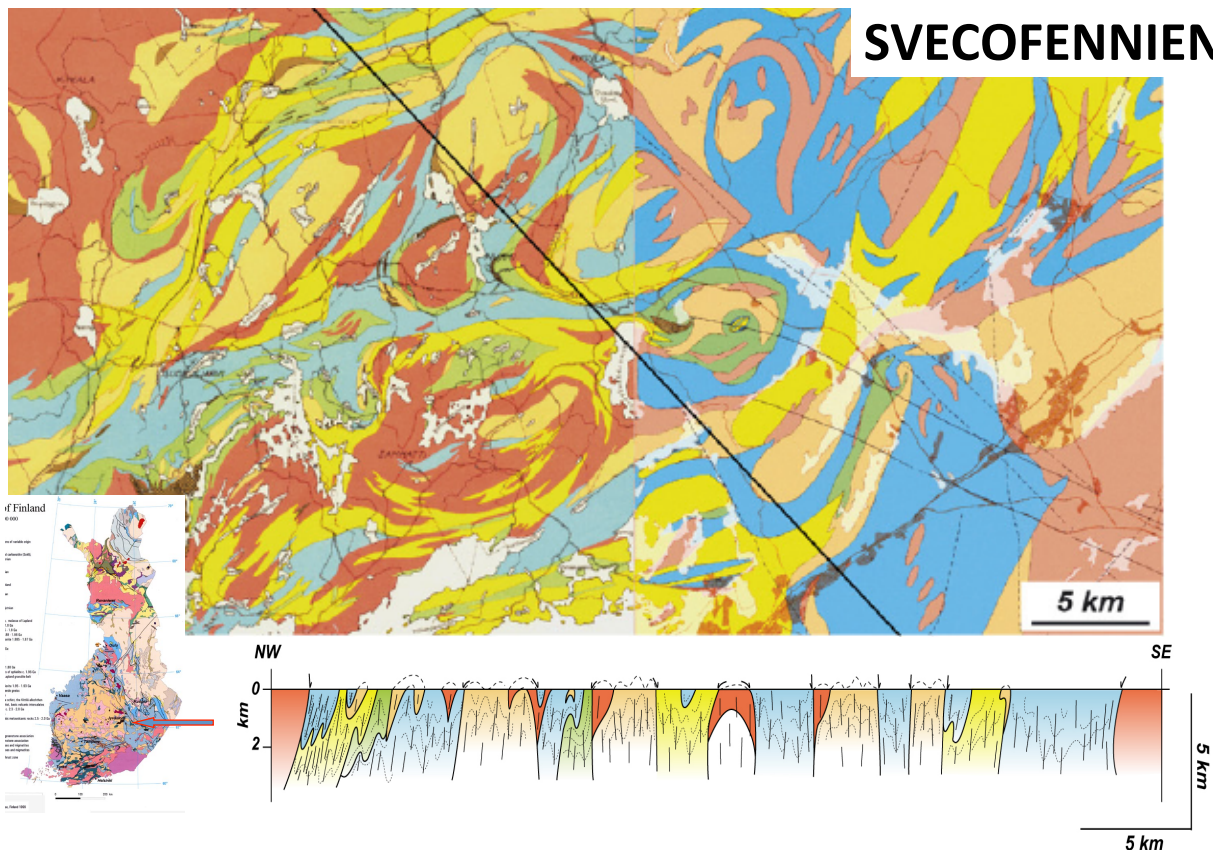
KARNATAKA



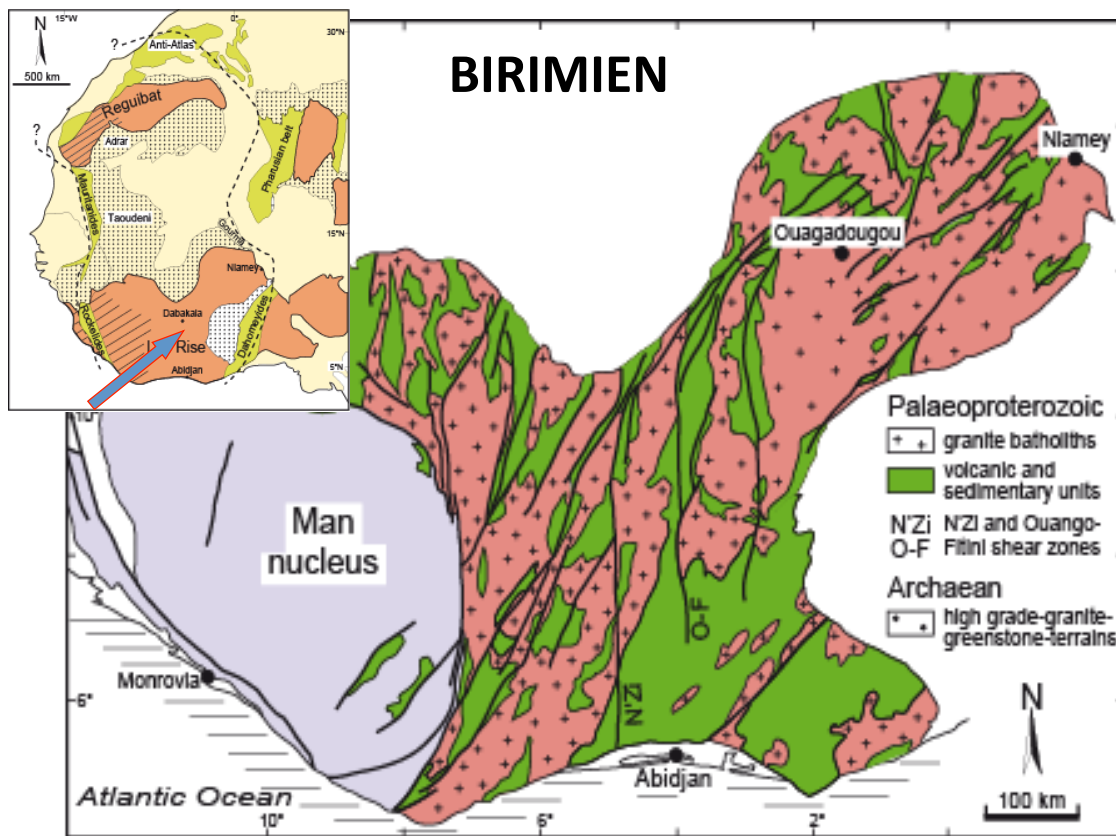
B.M. Ravindra & N. Ranganatha Department of Mines & Geology,
Karnataka, 1994

Source : Chardon & Jayananda, 2008

SVECOFENNIIEN



P. Barbey - Fév. 2012



Source : Gasquet et al., 2003

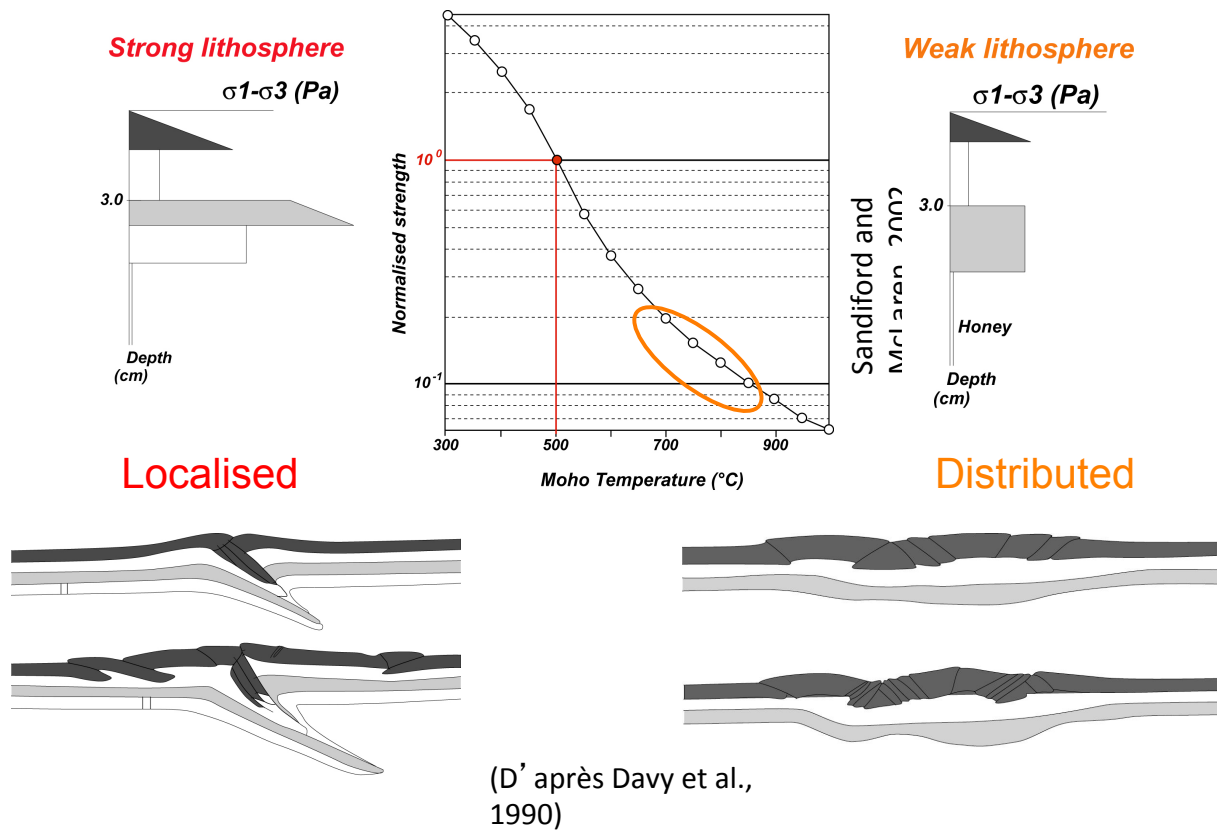
Orogène « moderne »

- chaînes à très faible rapport largeur/longueur
- collision continentale (Alpes, Himalaya)
- tectonique tangentielle en nappe
- généralisation des THP dans les chaînes

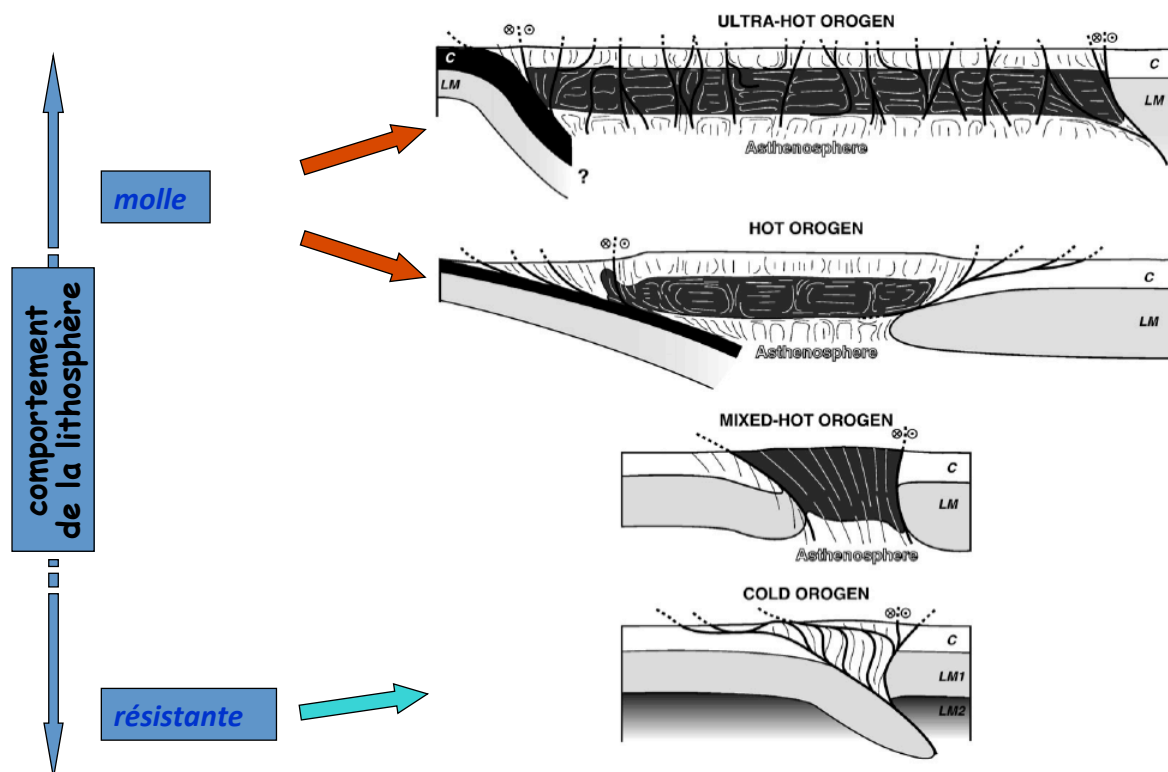
Orogène « ancien »

- dômes granitiques ou gneissiques
- bassins volcaniques et/ou sédimentaires
- tectonique verticale et accidents verticaux
- évidences de THP exceptionnelles

Modèles tectoniques analogiques



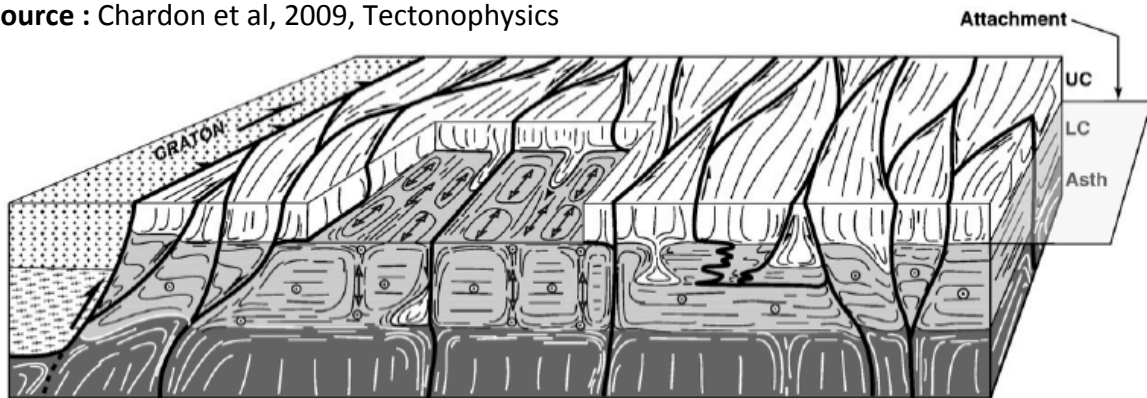
Modèles basés sur la rhéologie de la lithosphère



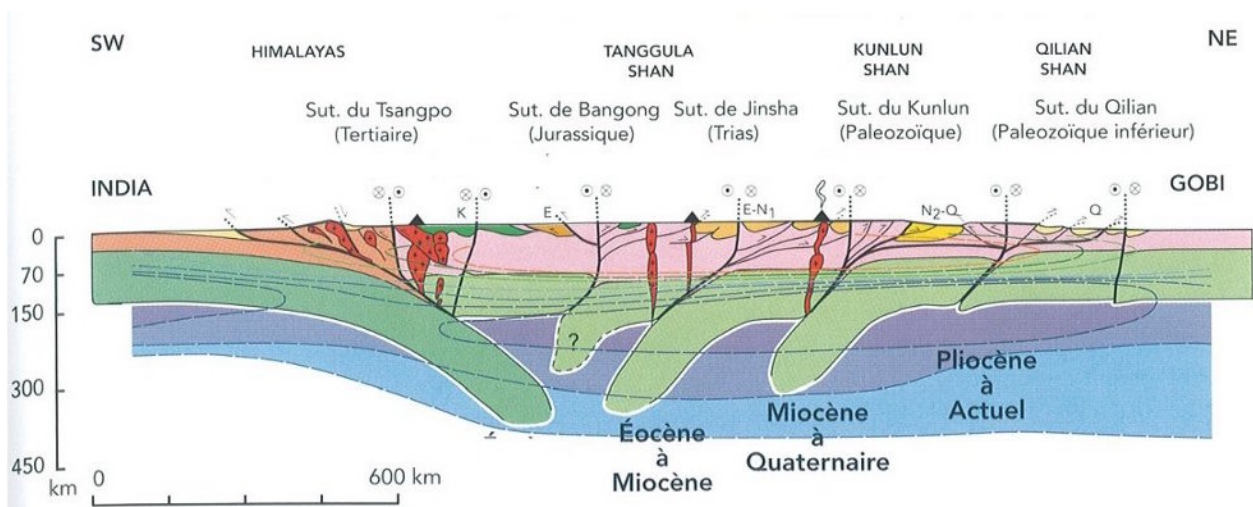
Source : Chardon et al, 2009, Tectonophysics

• Croûtes (très) chaudes en convergence

Source : Chardon et al, 2009, Tectonophysics



- raccourcissement distribué / épaisissement homogène
- redistribution de masse dans la croûte inférieure visqueuse
- écoulement à l'échelle de la chaîne / advection verticale et horizontale
- peu ou pas de relief (compétition surrection / érosion)



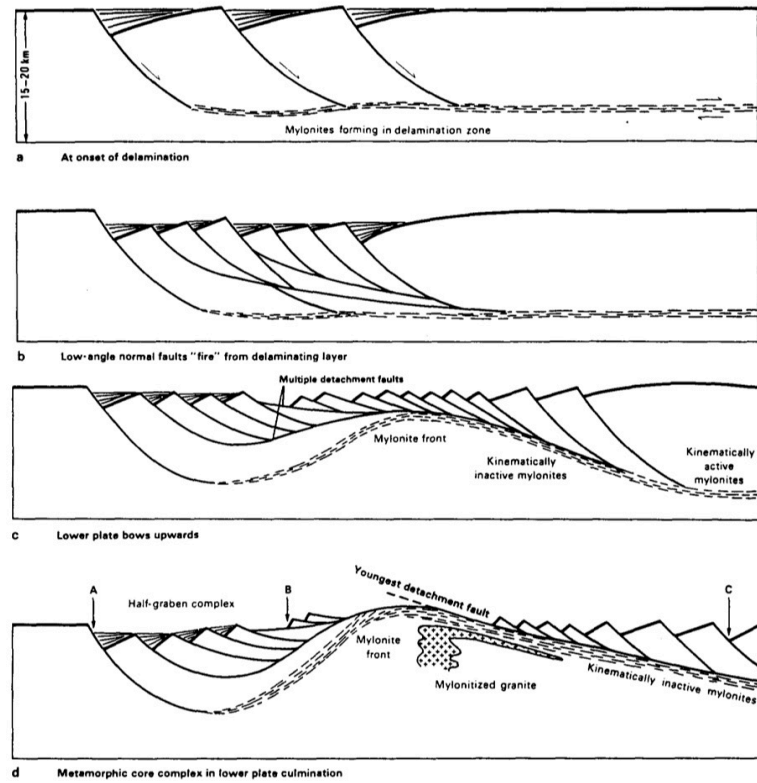
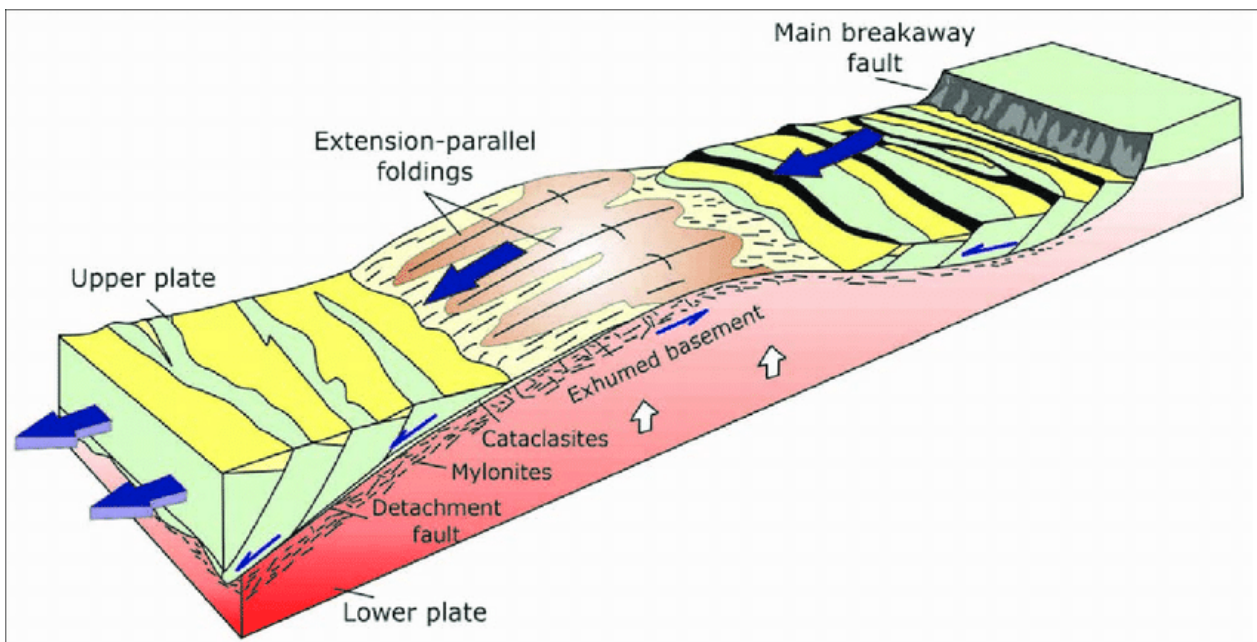
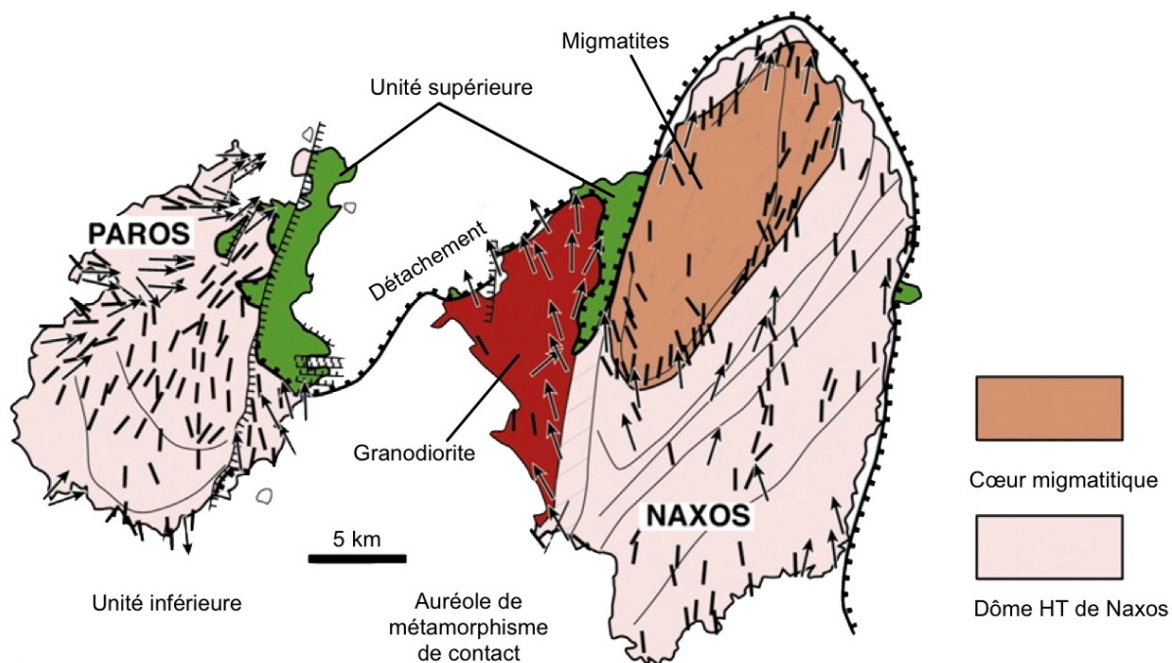


Fig. 20. Model of the development of a metamorphic core complex assuming (a) an initially sub-horizontal ductile shear zone at depth, decoupling the middle to lower crust beneath a steeply-dipping array of deeply-biting normal faults in the upper plate. (b) Low-angle normal faults are spawned from this zone, and the geometry of upper plate extension becomes increasingly complex. The detachment faults splaying from the basal shear zone act as master faults, controlling the generation of successive faults. (c) As the result of unloading, and as the result of the isostatic effects of granite intrusion at depth, the lower plate bows upward, with multiple detachment faults splaying from the developing culmination. The older





Jolivet et al. (2009) *Earth Planet. Sci. Lett.* 285

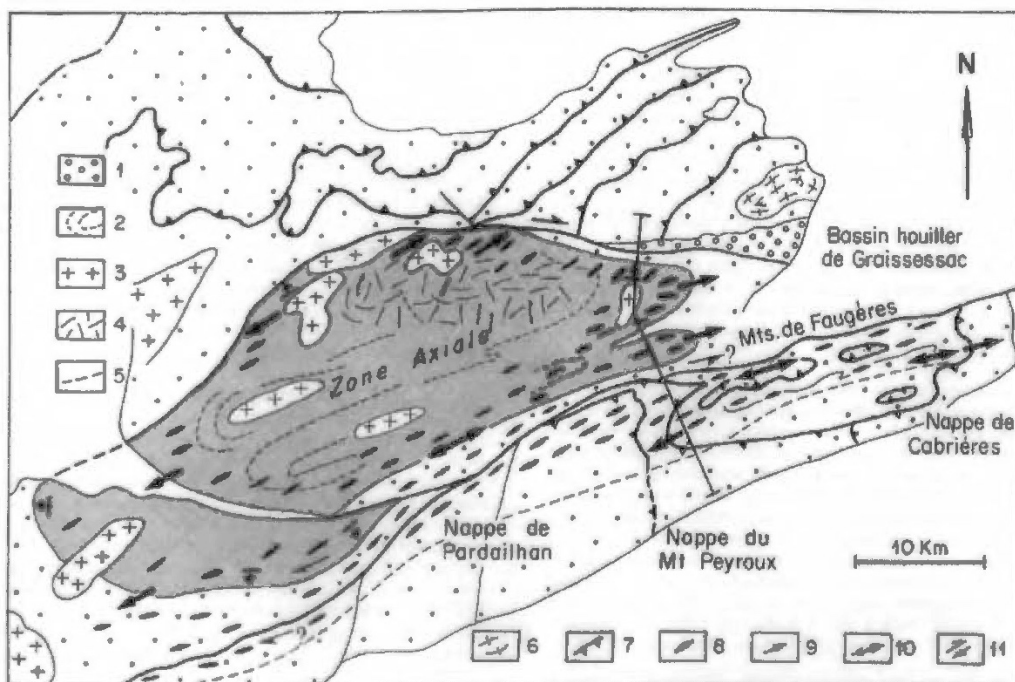
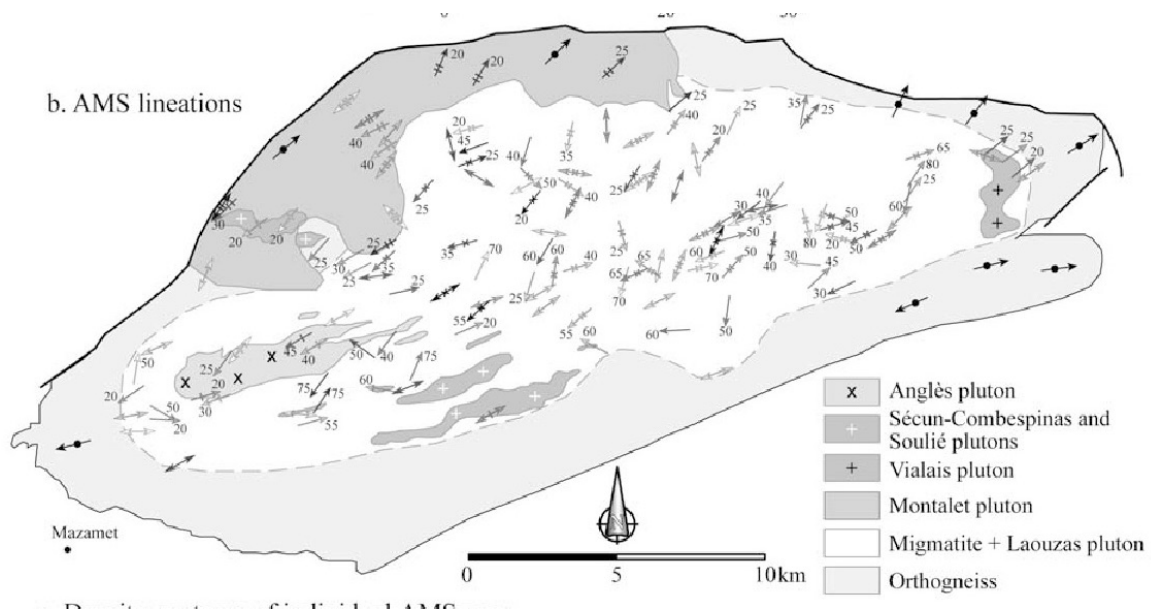


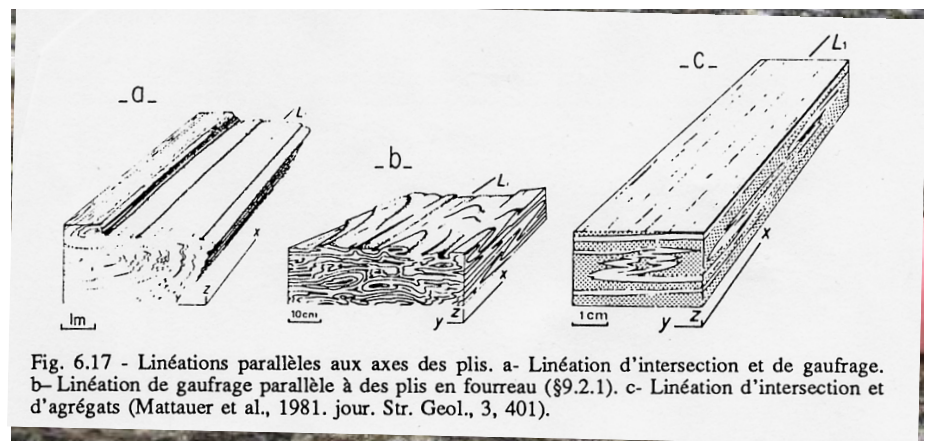
Fig 1 - Carte structurale schématique de la Montagne Noire et trace de la coupe fig. 3. La Zone Axiale gneissique est grisée.
 1) Stéphanien du bassin de Graissessac 2) Gneiss et micaschistes avec trace de foliation plissée soulignant les structures majeures.
 3) Granites 4) Gneiss anatectiques. 5) Limite sud de la schistosité post-nappe. 6) Orthogneiss granitique du Mendic. 7) Principales
 bases de nappes 8) Linéations d'allongement. 9) Sens de cisaillement ductile. 10) Etirement coaxial. 11) Décrochement.
 Fig. 1 - Structural sketch map of the Montagne Noire and location of the section fig. 3. The metamorphic Axial Zone is in grey.
 1) Graissessac Stephanian basin 2) Gneiss and micaschists with the trace of the major post-folial folds. 3) Granites. 4) Anatectic
 gneisses. 5) Southern limit of post-nappe cleavage. 6) Mendic granitic orthogneiss. 7) Main basal contacts of nappes. 8) Stretching
 lineations. 9) Sense of ductile shear. 10) Coaxial stretching. 11) Strike-slip fault.





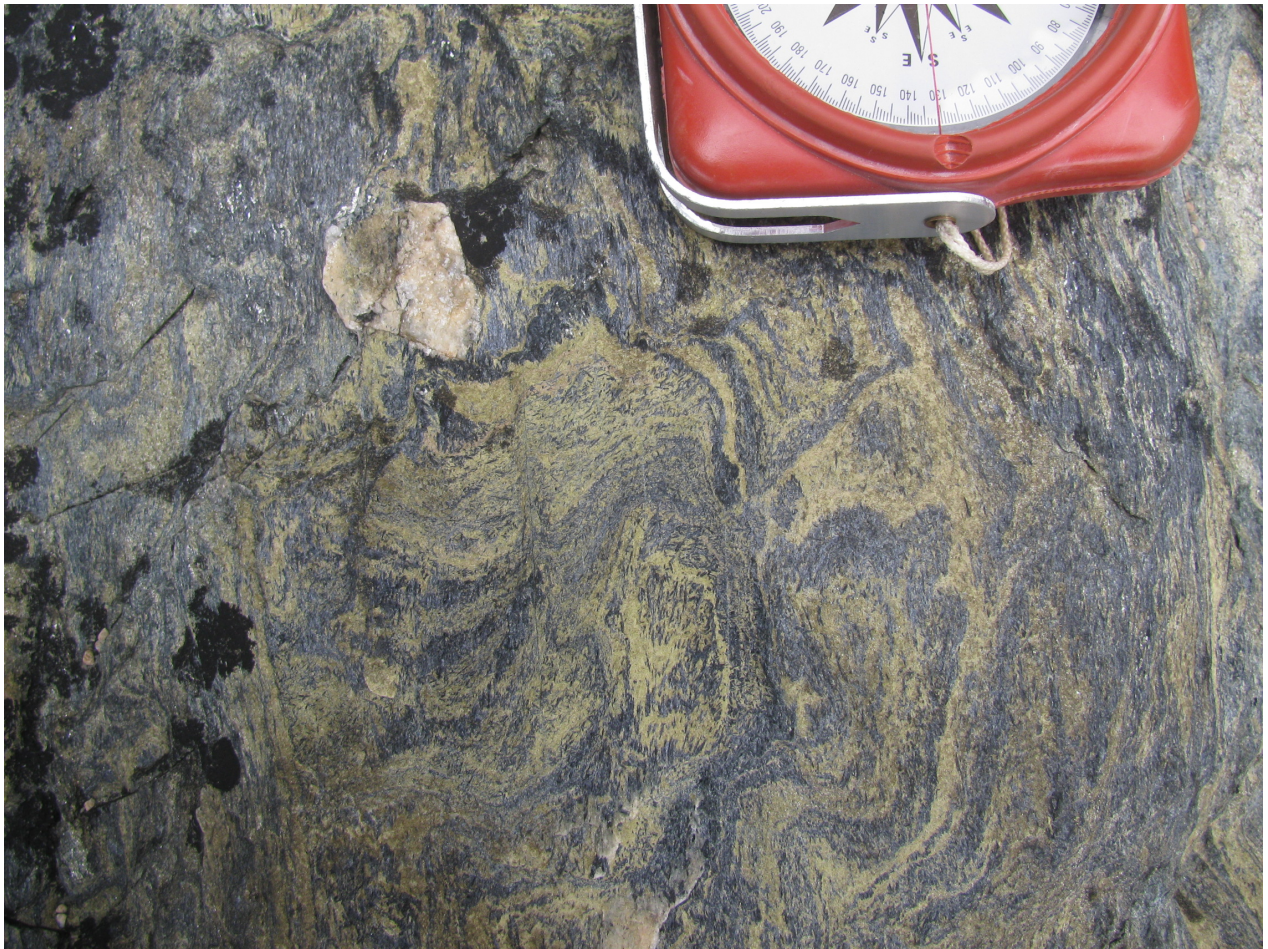


Plis:
Axe // L



Ne donne pas sens
cisaillement







Disposition relative méta-basite/méta-sédiment







N

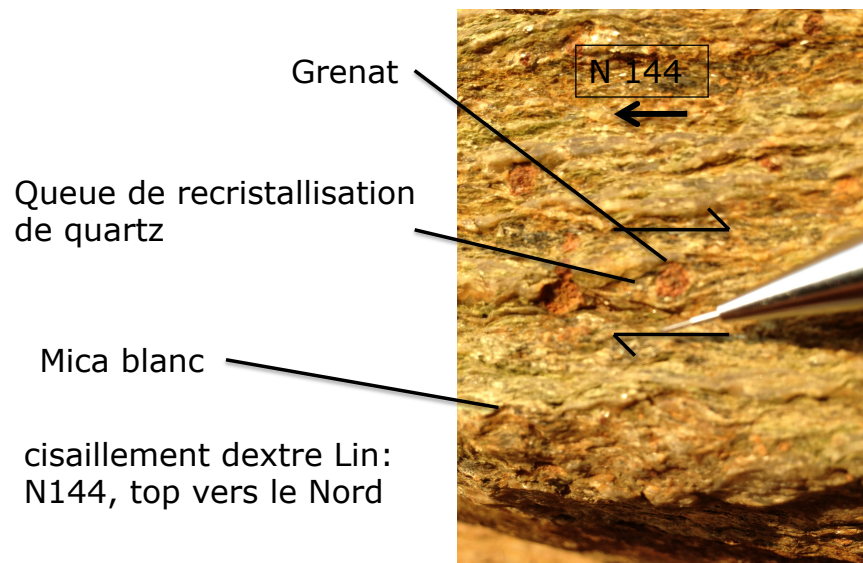
Position relative schiste bleu/schiste vert

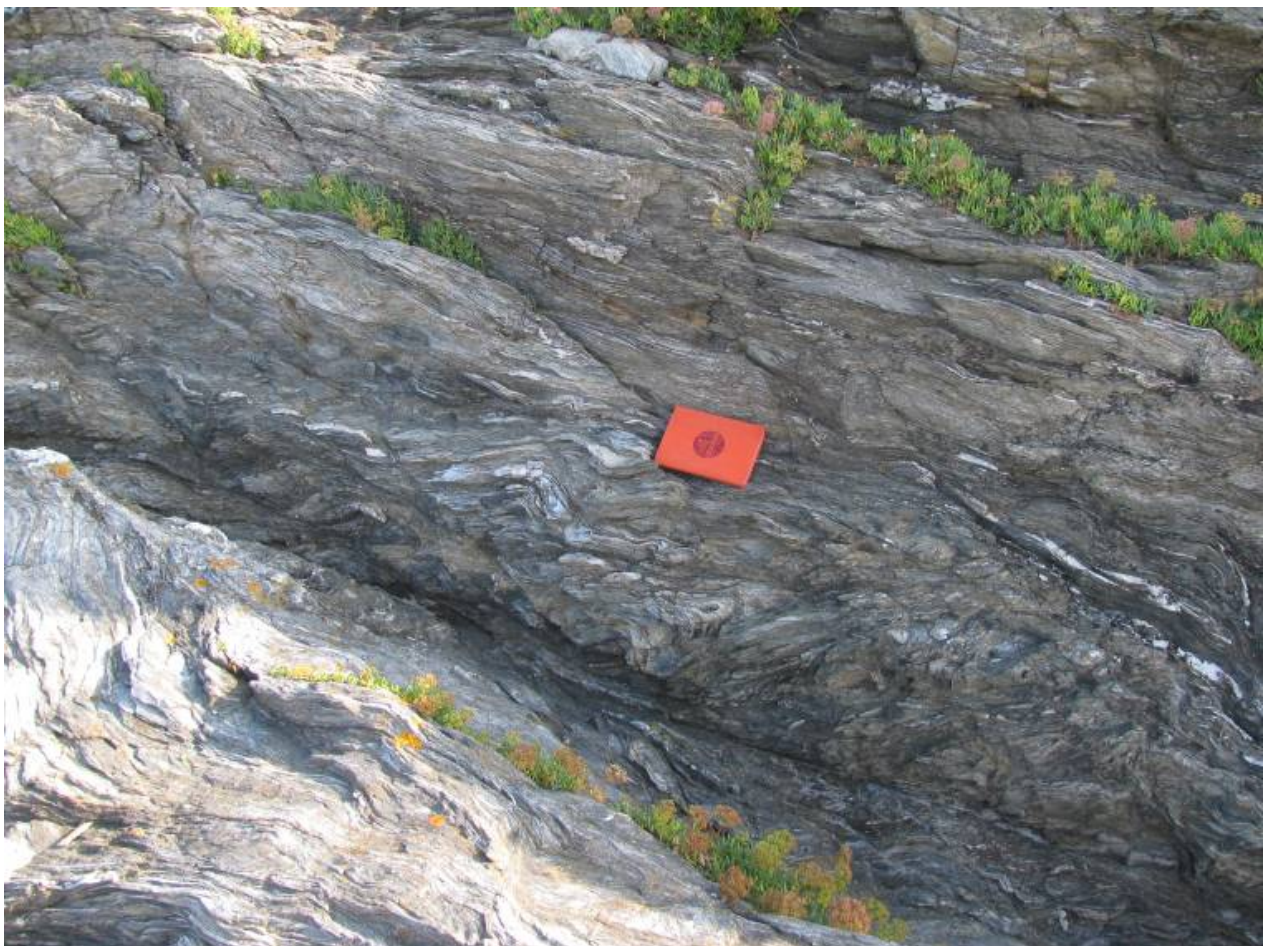
S





Marqueurs cinématiques



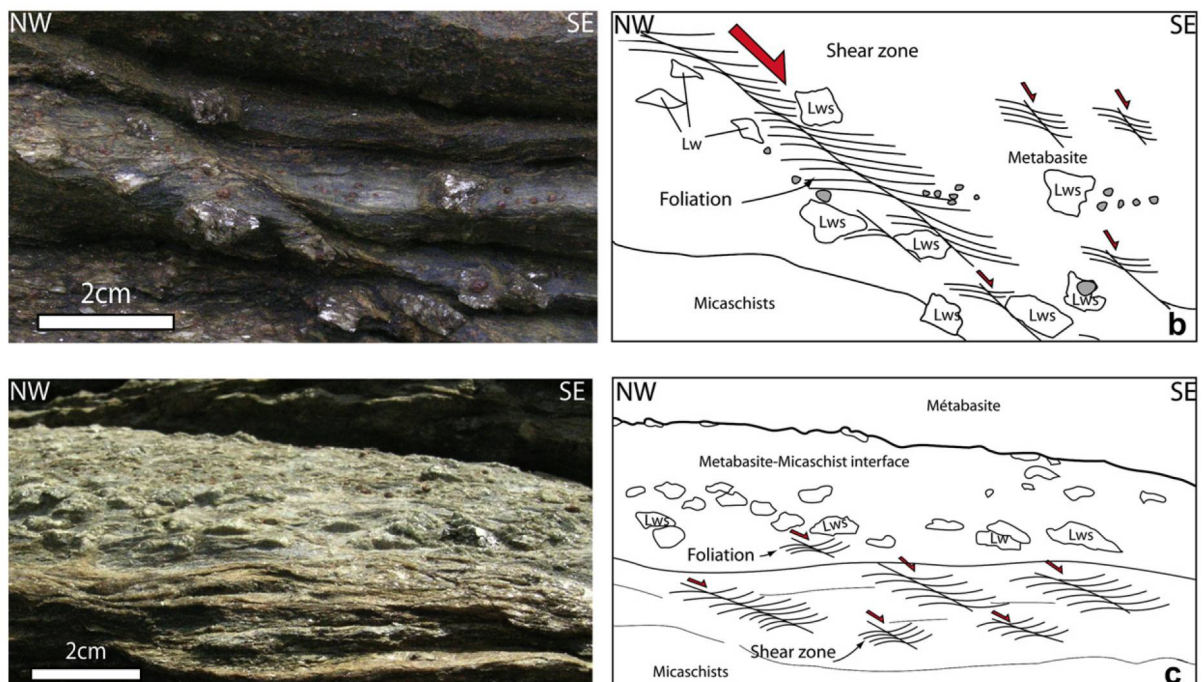




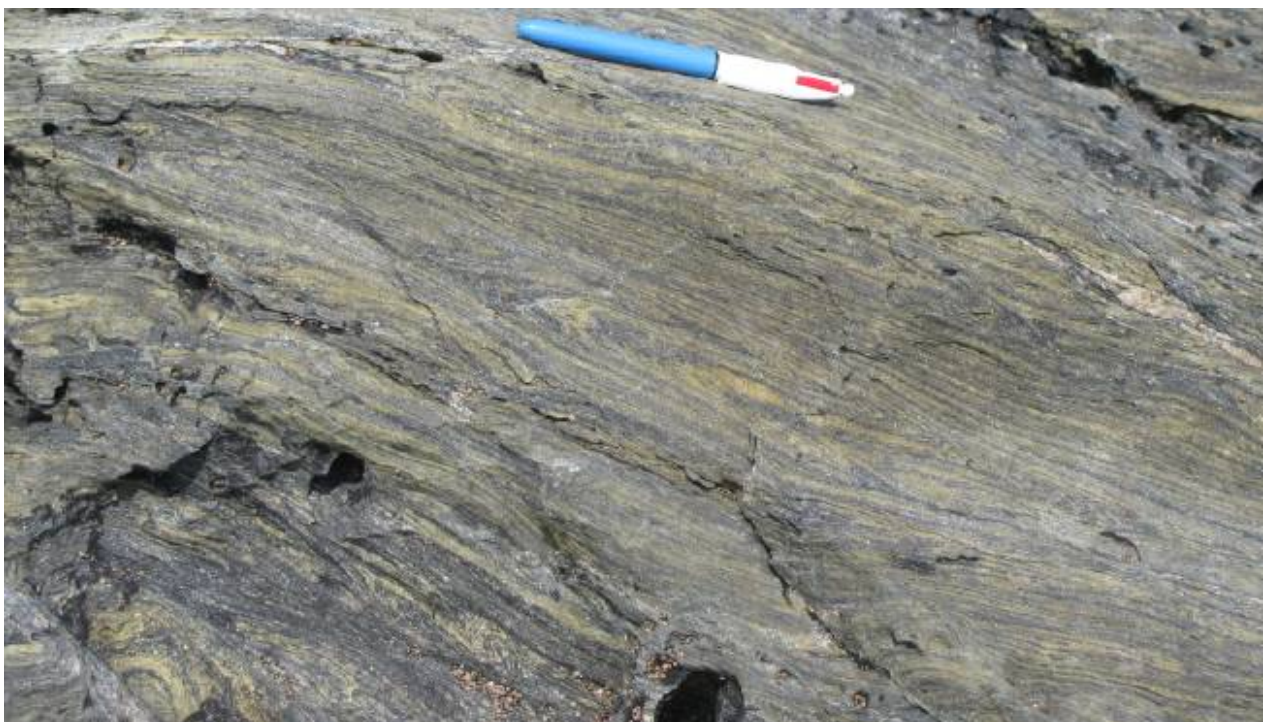
Kinematic records of subduction and exhumation in the Ile de Groix blueschists (Hercynian belt; Western France)

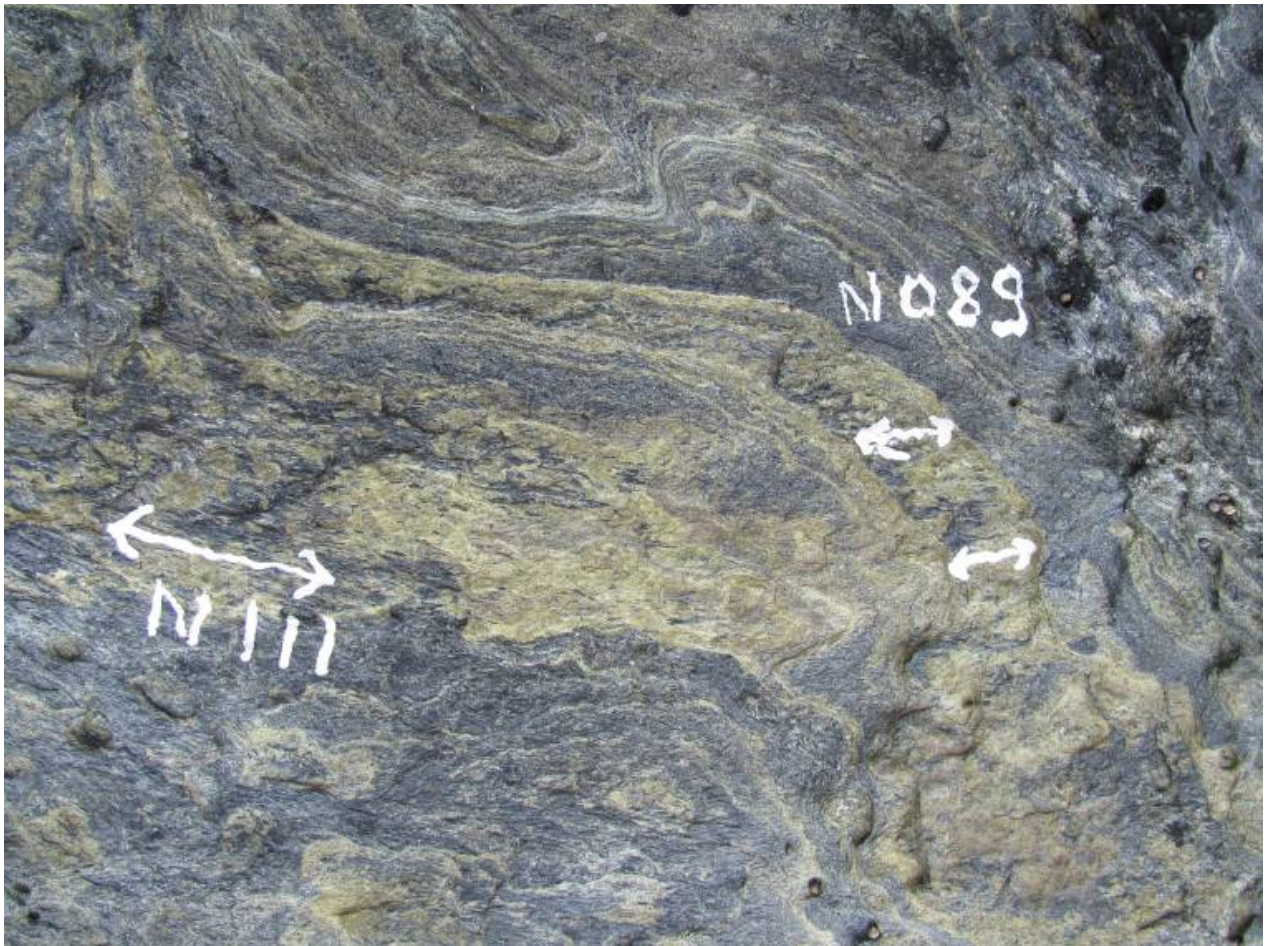
Melody Philippon*, Jean Pierre Brun, Frédéric Gueydan

Géosciences Rennes UMR 6118 CNRS, Université de Rennes 1, 35042 Rennes Cedex, France



Peut on trouver une ancienne linéation ?





Vu par les élèves:

- Chronologie relative des évènements en contexte métamorphique
- Liens litho - compétence des roches - structure - zone de circulation fluide

Questions en suspens ?

- 4 générations de quartz ; liens avec l' évolution des fluides ?
- Mode « d' écoulement » des fluides les plus précoces (albitisation) ? flux poreux contrôlé par l'anisotropie ?
- Une linéation ancienne préservée dans le cœur plissé des boudins ?

