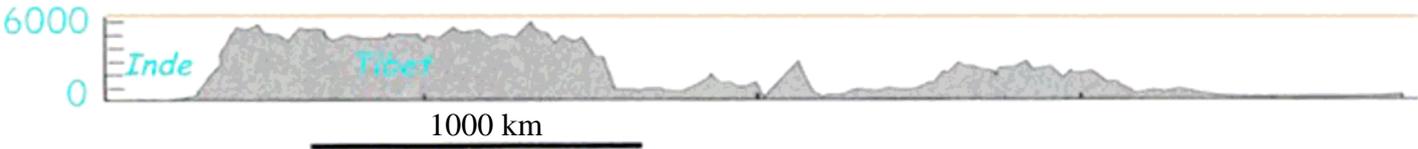
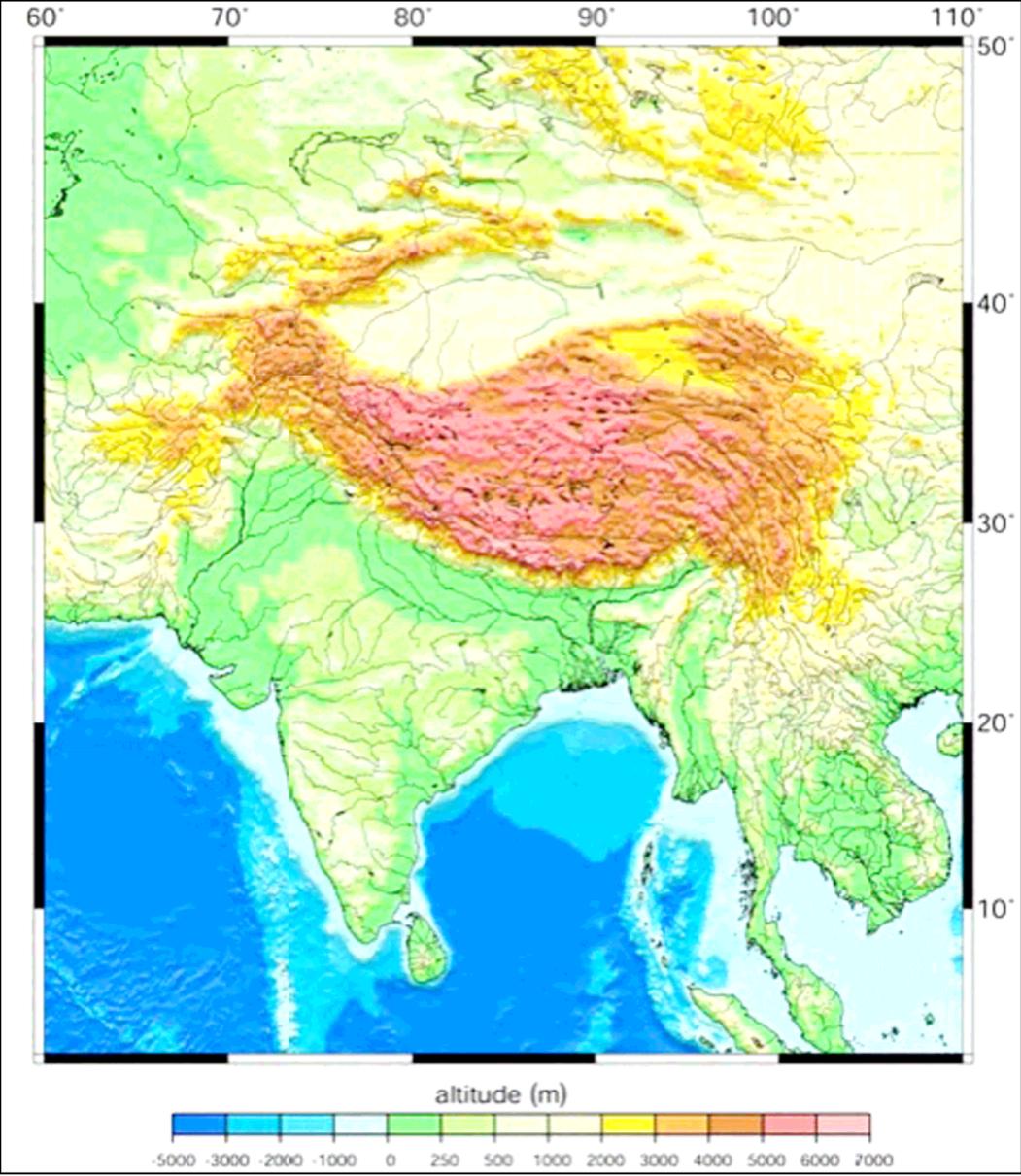


# La collision Inde - Eurasie



# Physiographie du continent asiatique



# La chaîne himalayenne





W



E



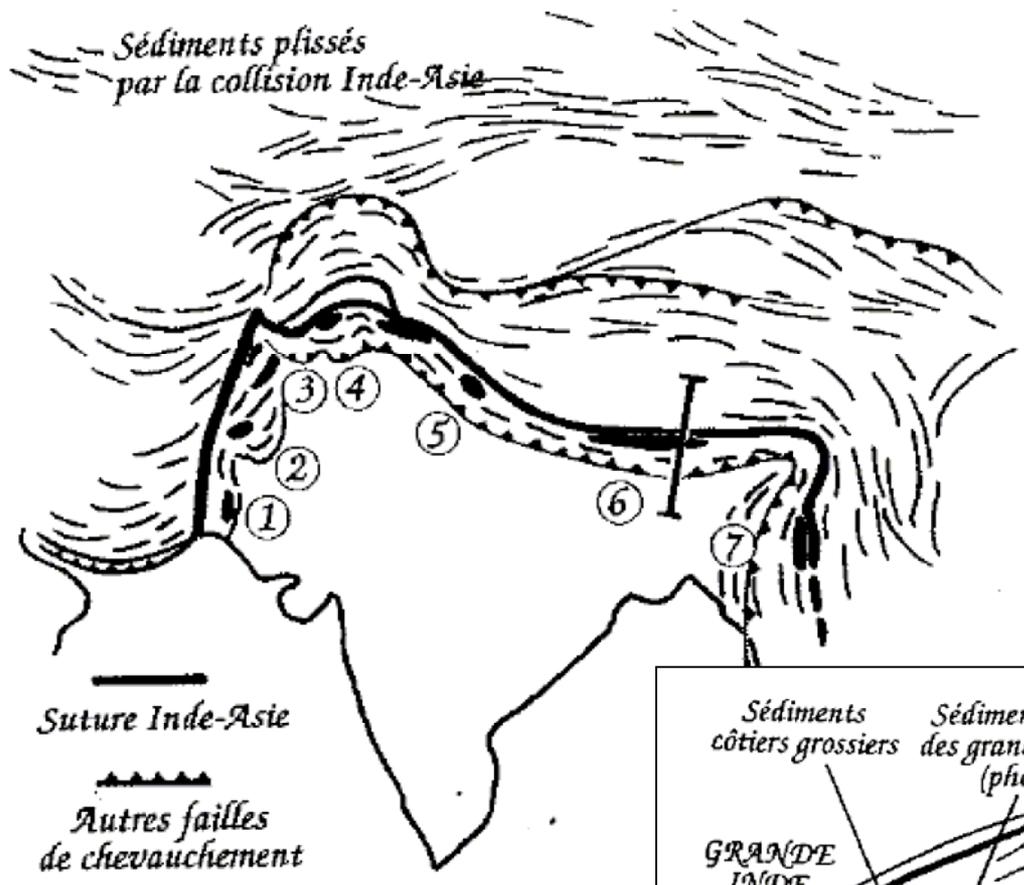




W

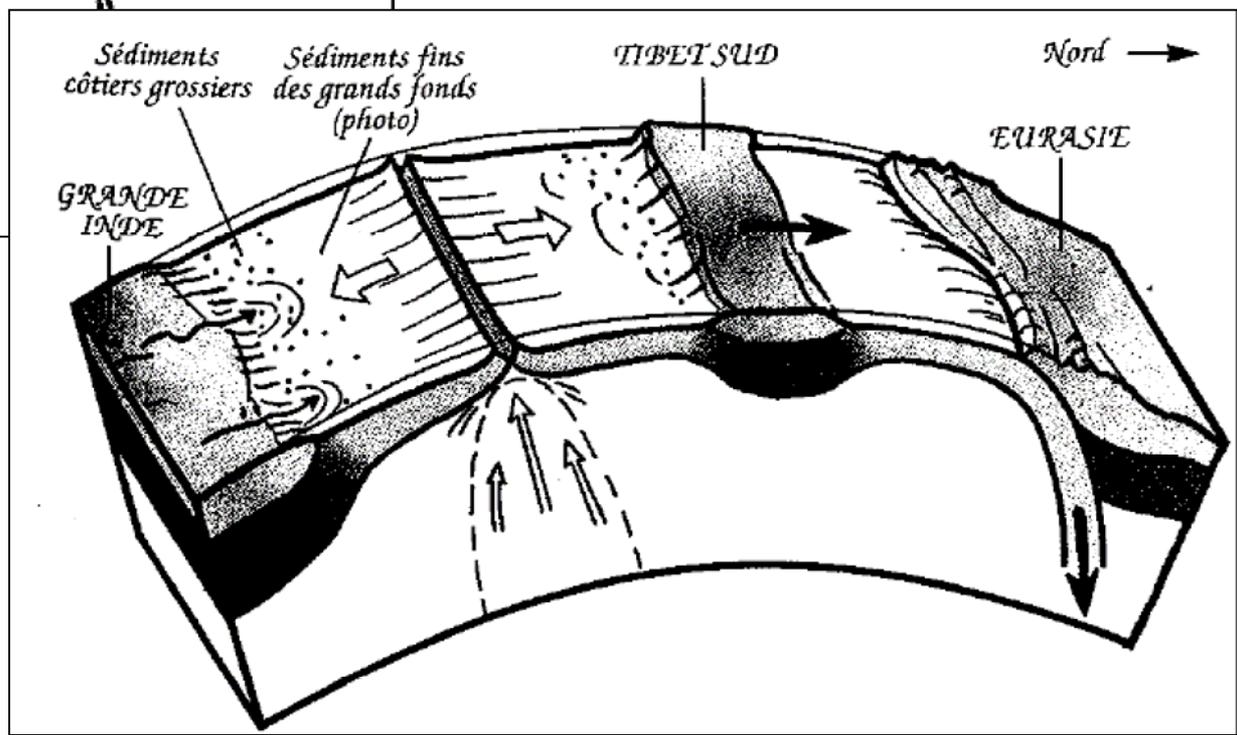
E



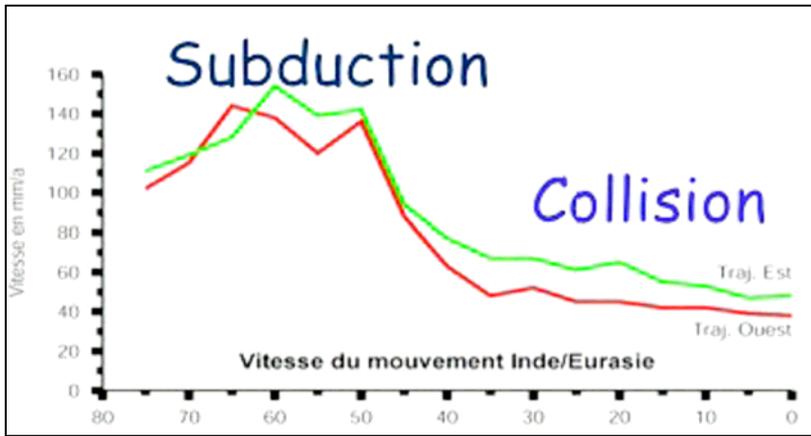
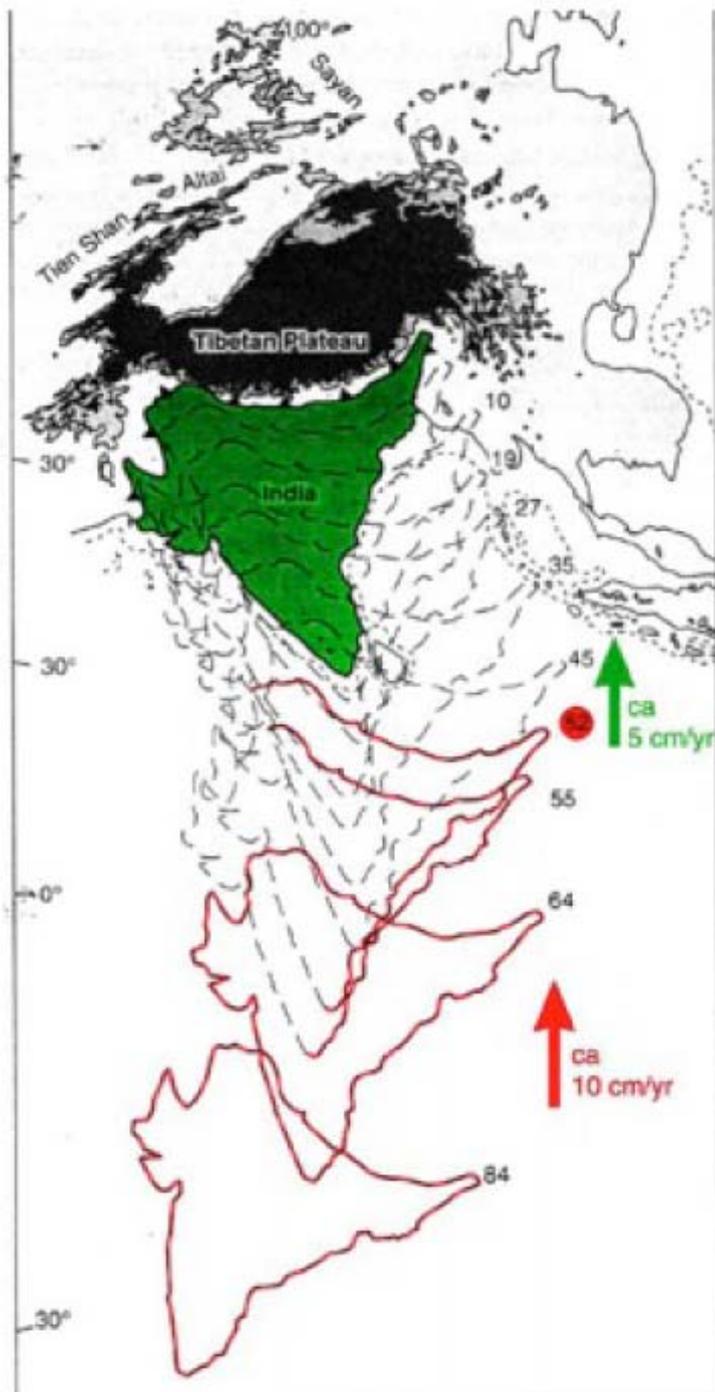


Mattauer, 1998

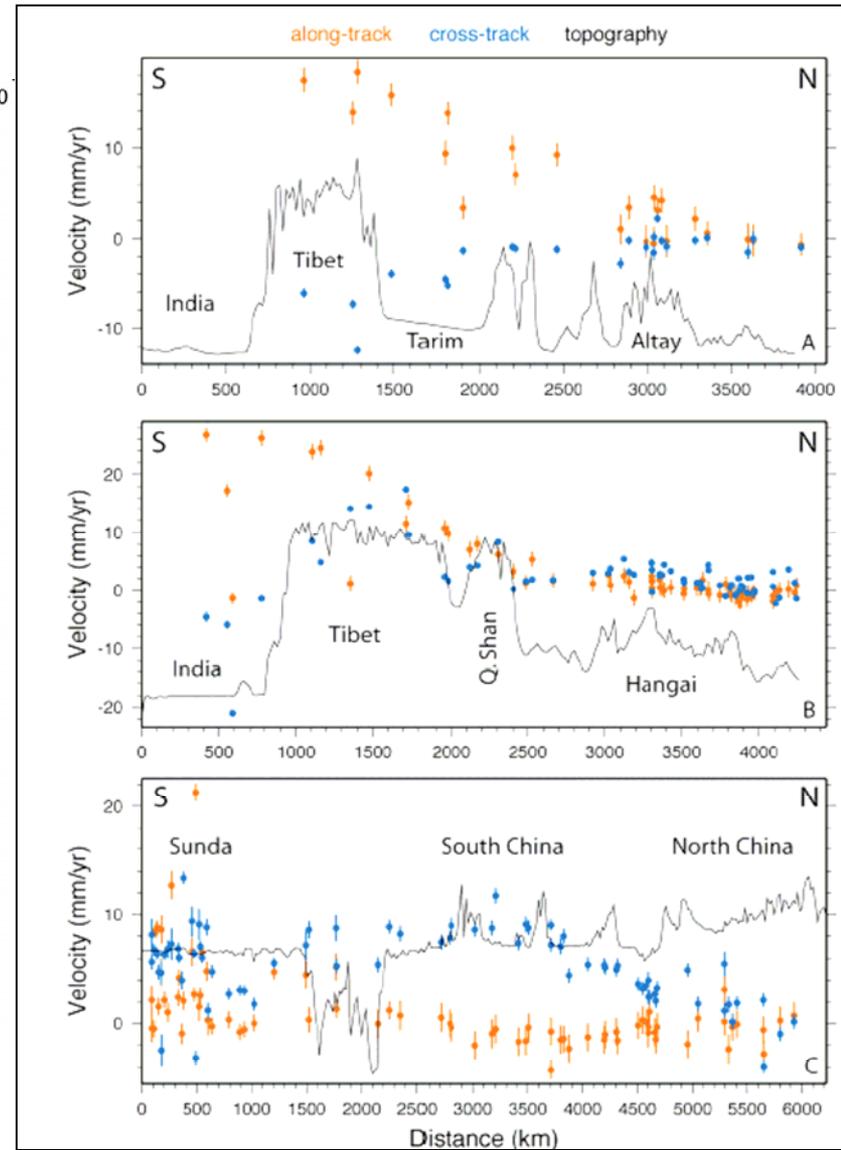
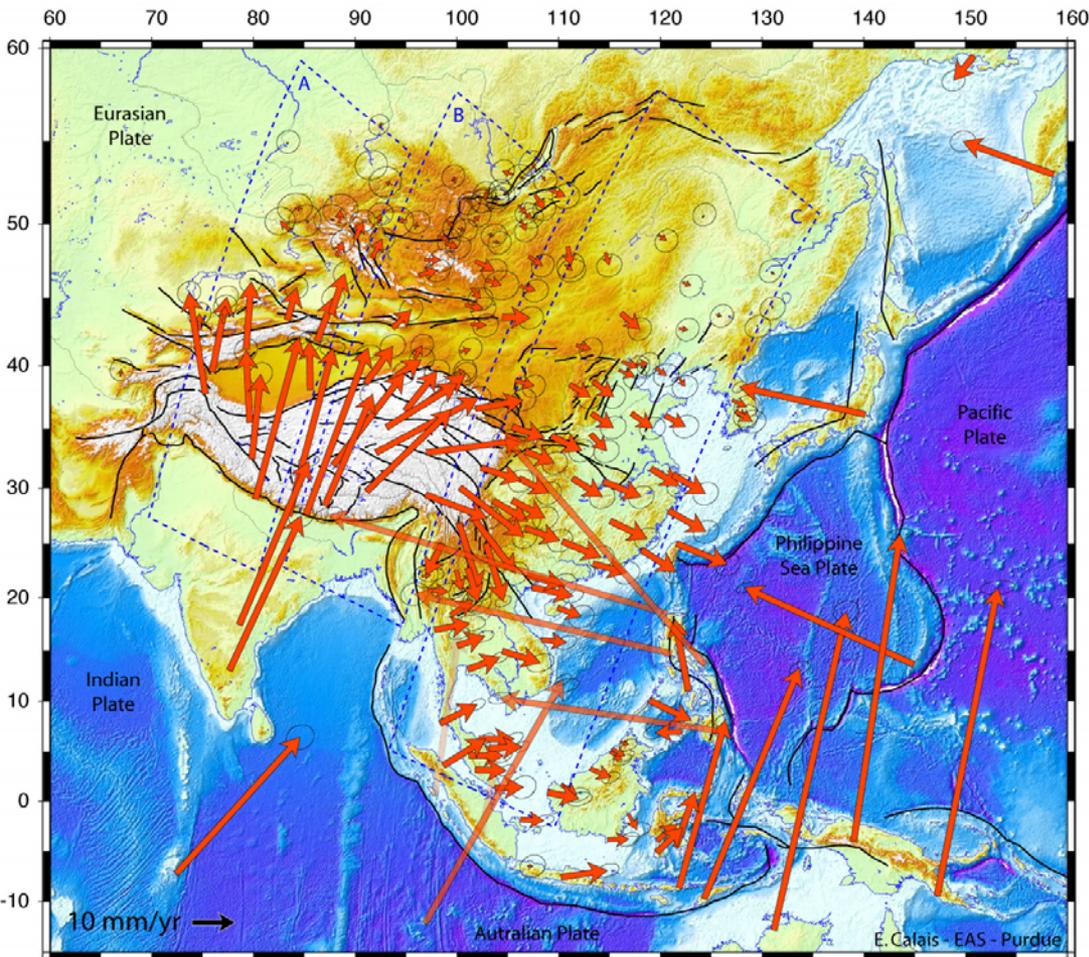
Traces d'un ancien océan:  
toujours la Téthys !



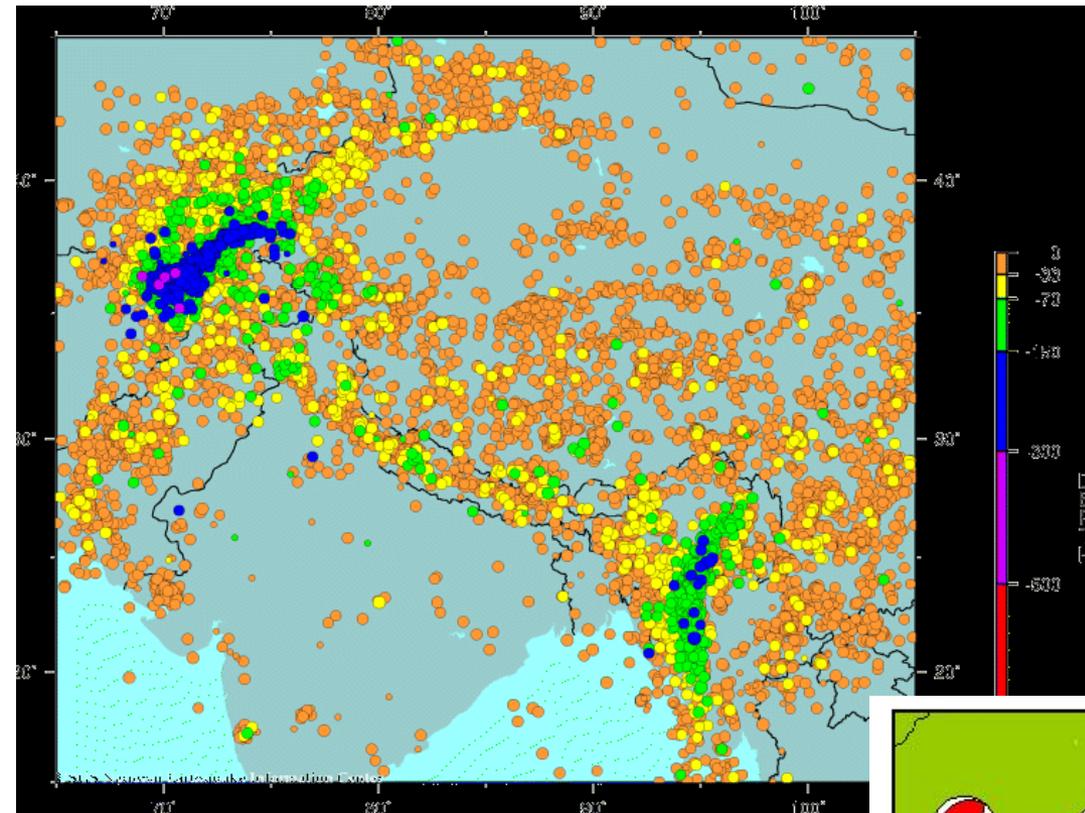
# Vitesse de convergence au cours des temps géologiques



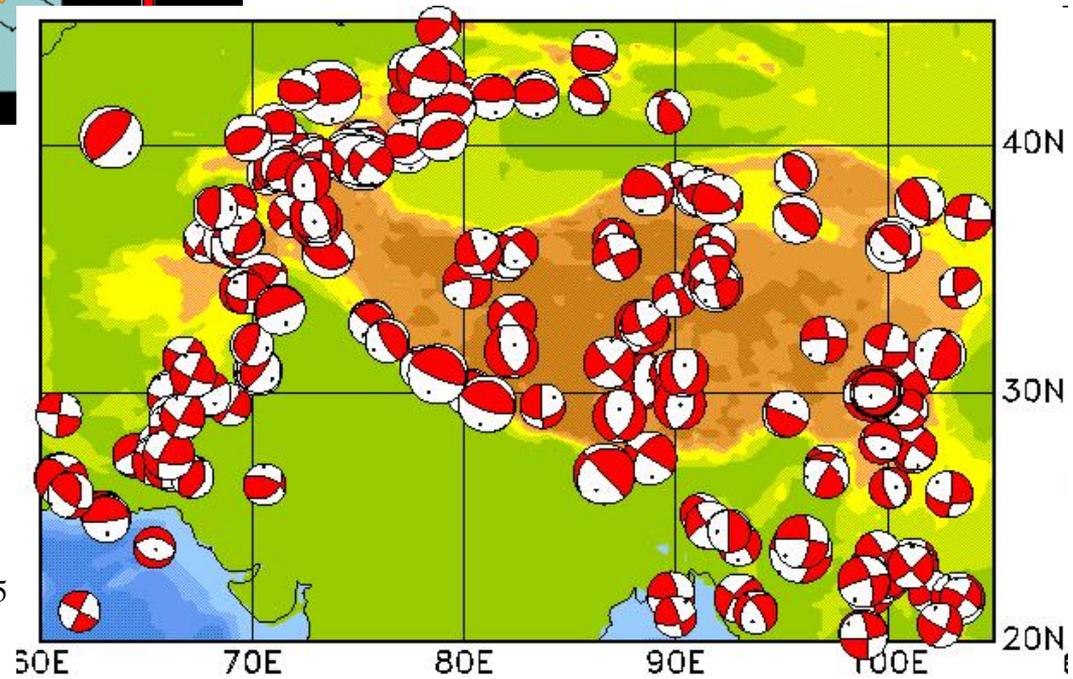
# Mouvements actuels



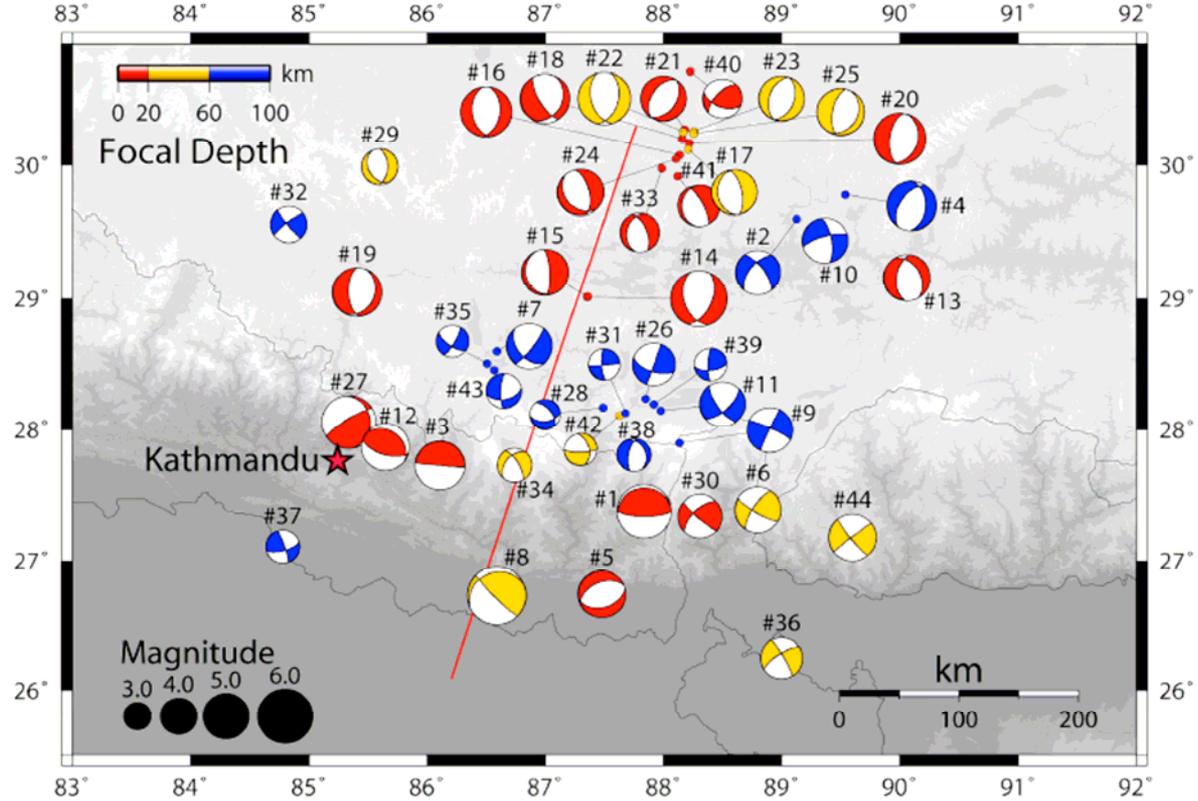
# Sismicité



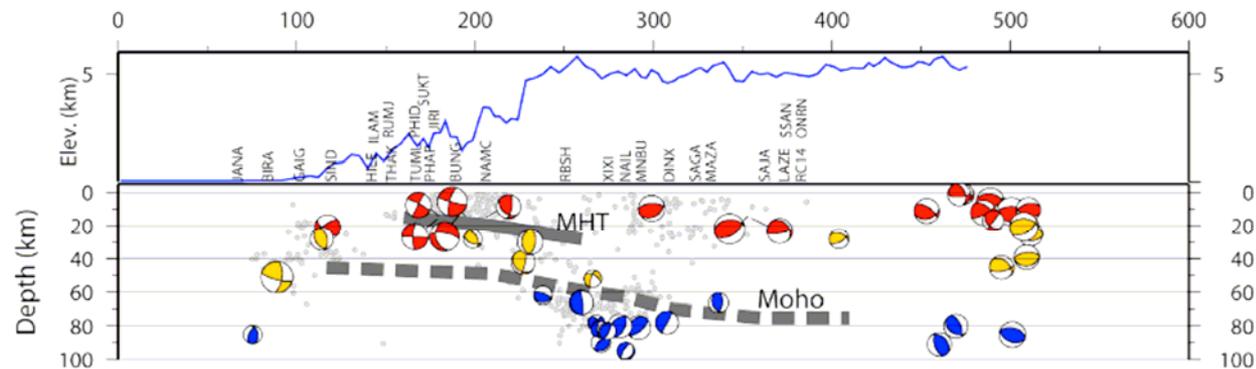
Profondeur des séismes de 1973 à 2002, USGS



Mécanismes au foyer séismes  $M > 5$   
Harvard, CMT 2000

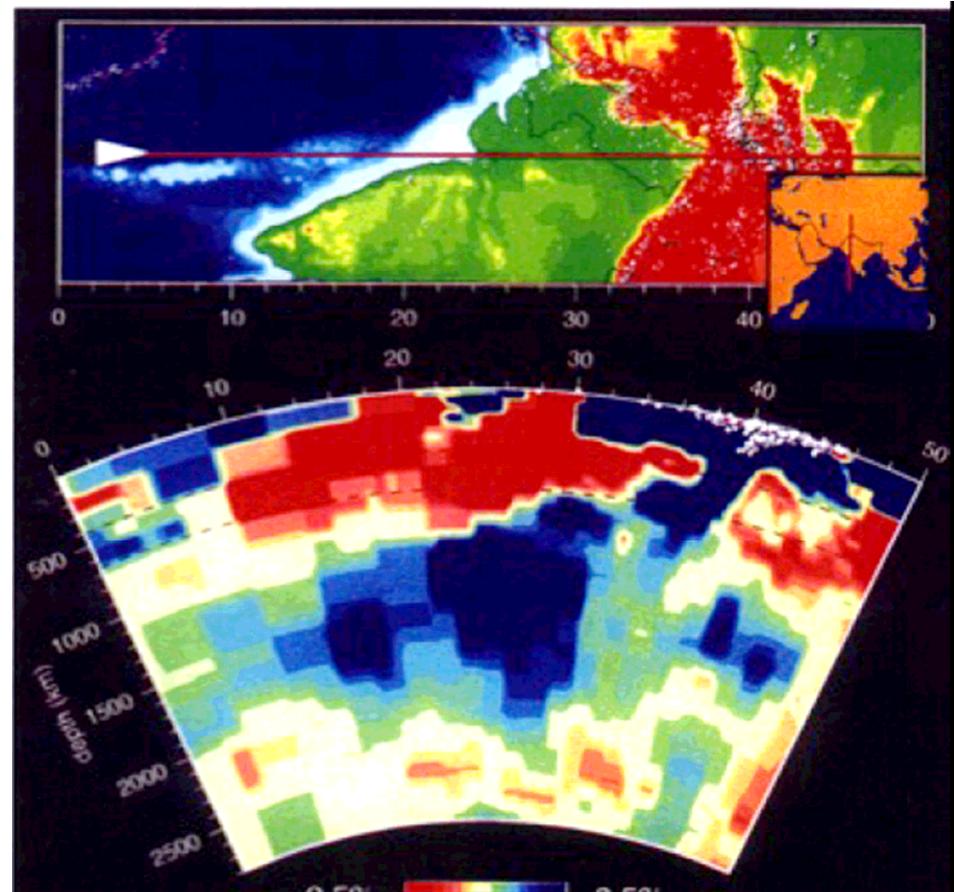
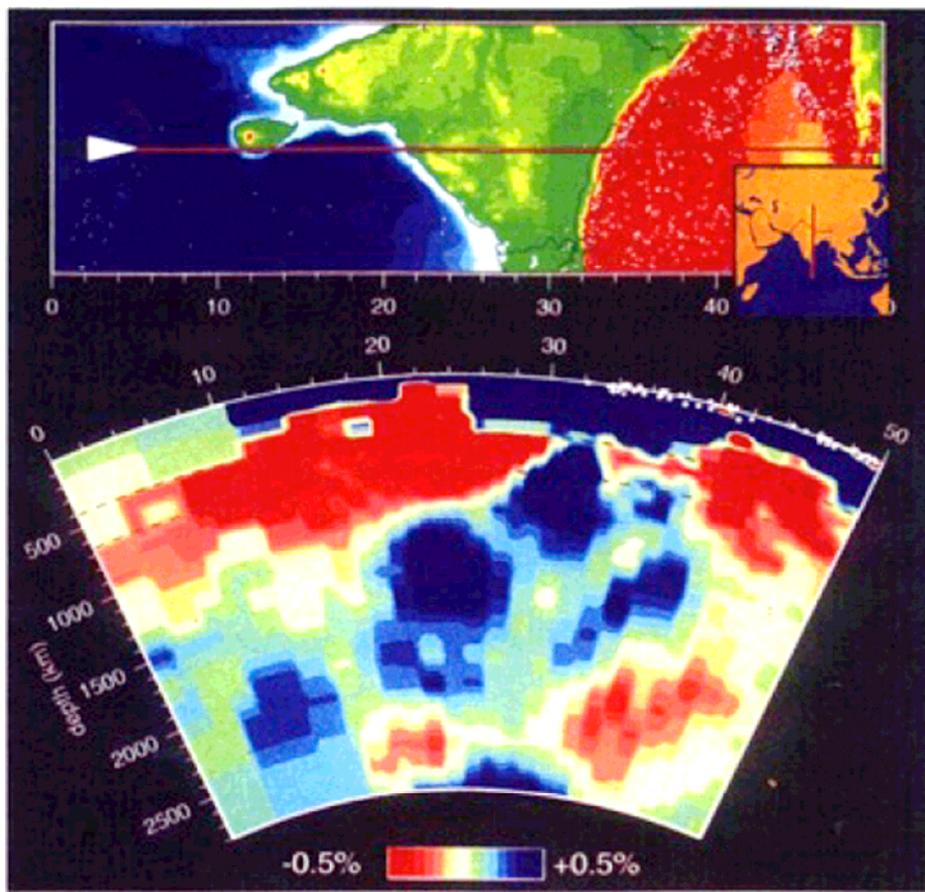


Focal mechanisms from de la Torre et al. (2007) and other studies. Symbol size scales with magnitude and color corresponds to event depth.  
 km from 26.0N 86.2E, 018° azimuth



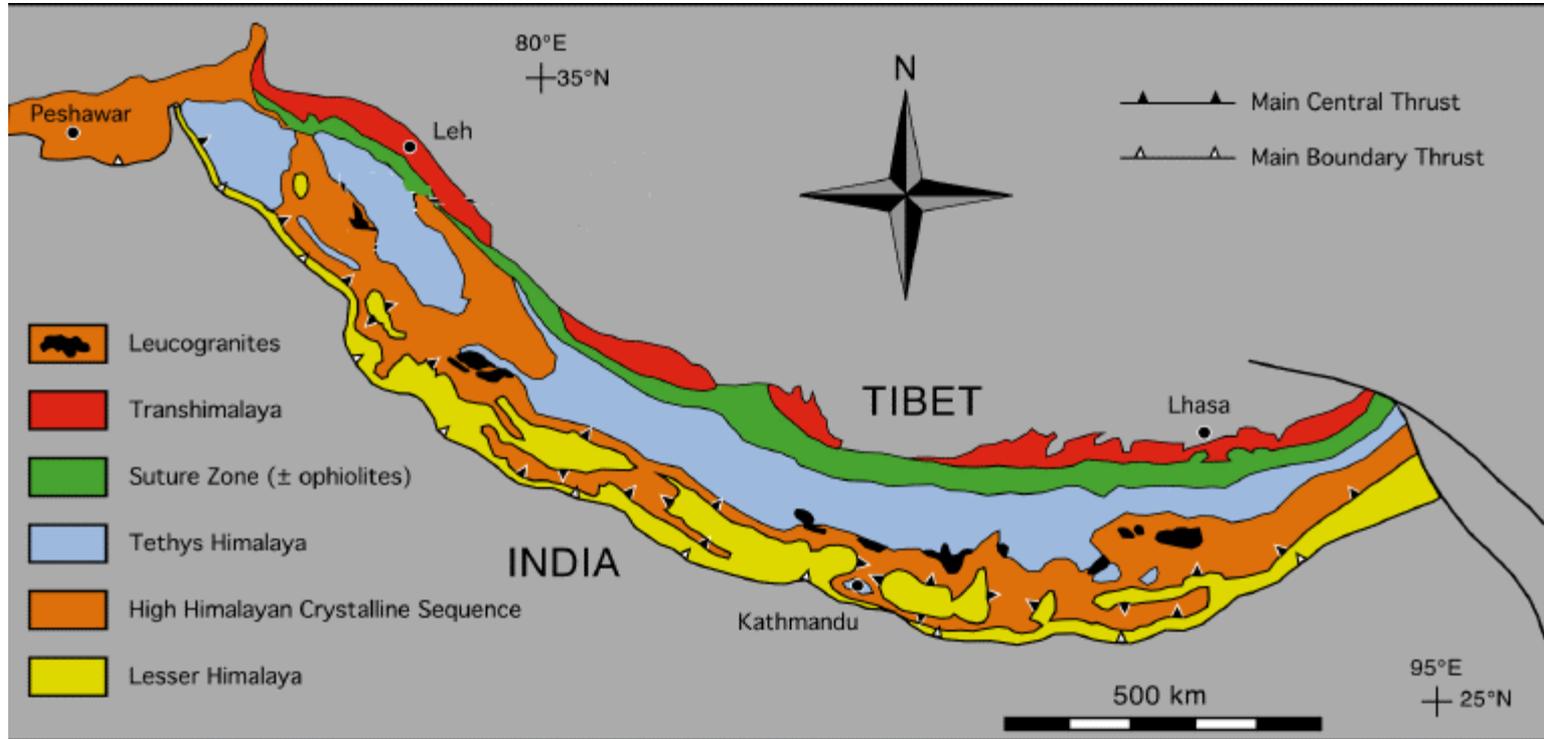
Cross section showing seismicity and focal mechanisms. Grey lines denote Main Himalayan Thrust (MHT) and the Moho from Schulte-Pelkum et al. (2005). Regional topography is plotted above the seismicity with approximate locations of the HIMNT stations.

# Profils tomographiques: structure profonde

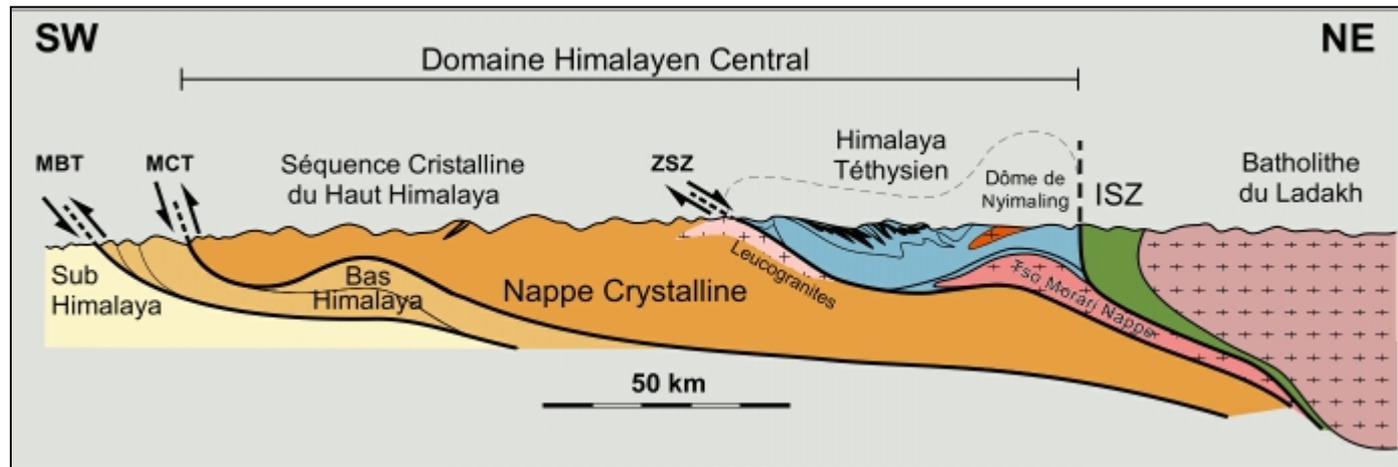


Van der Voo et al., 1999

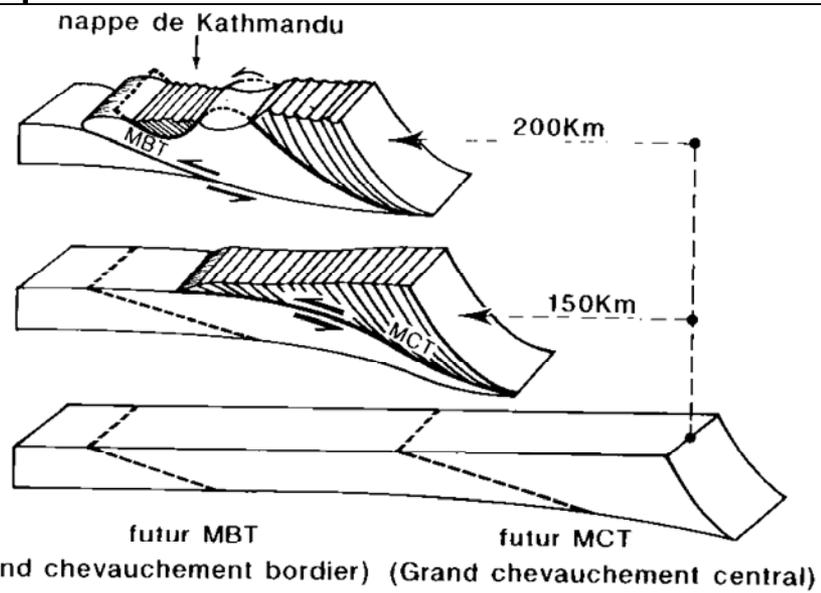
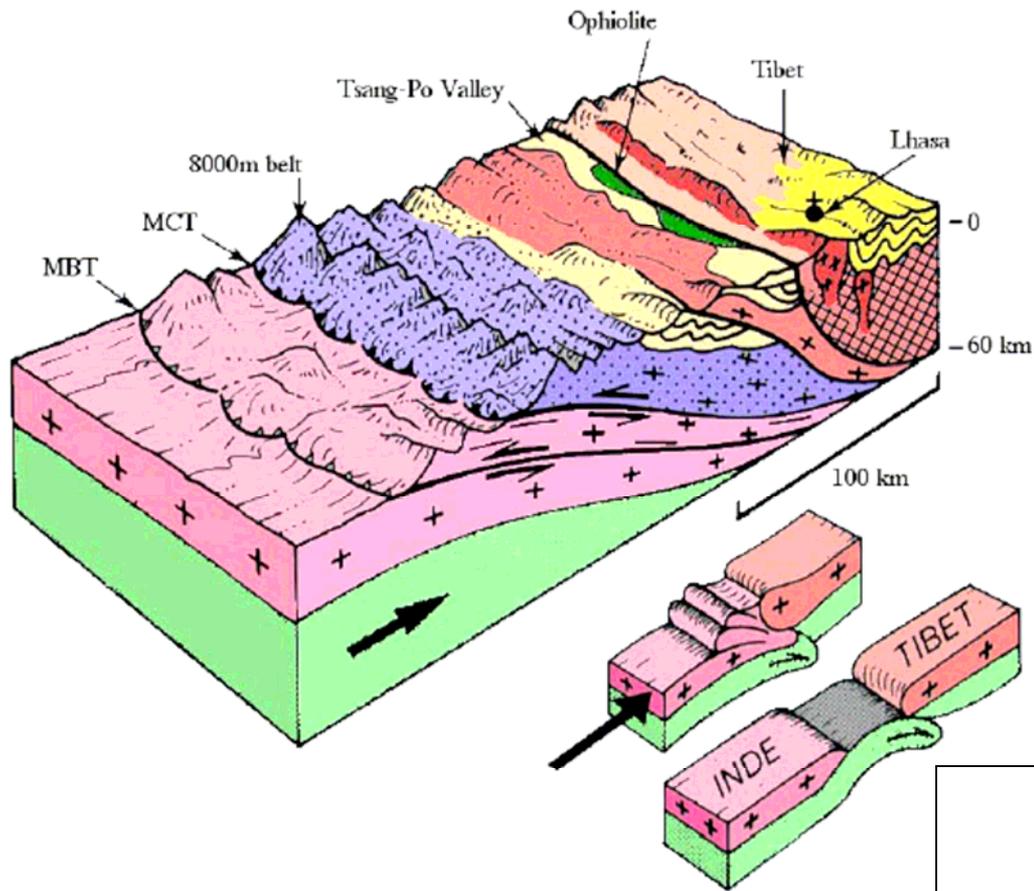
# Géologie et structures

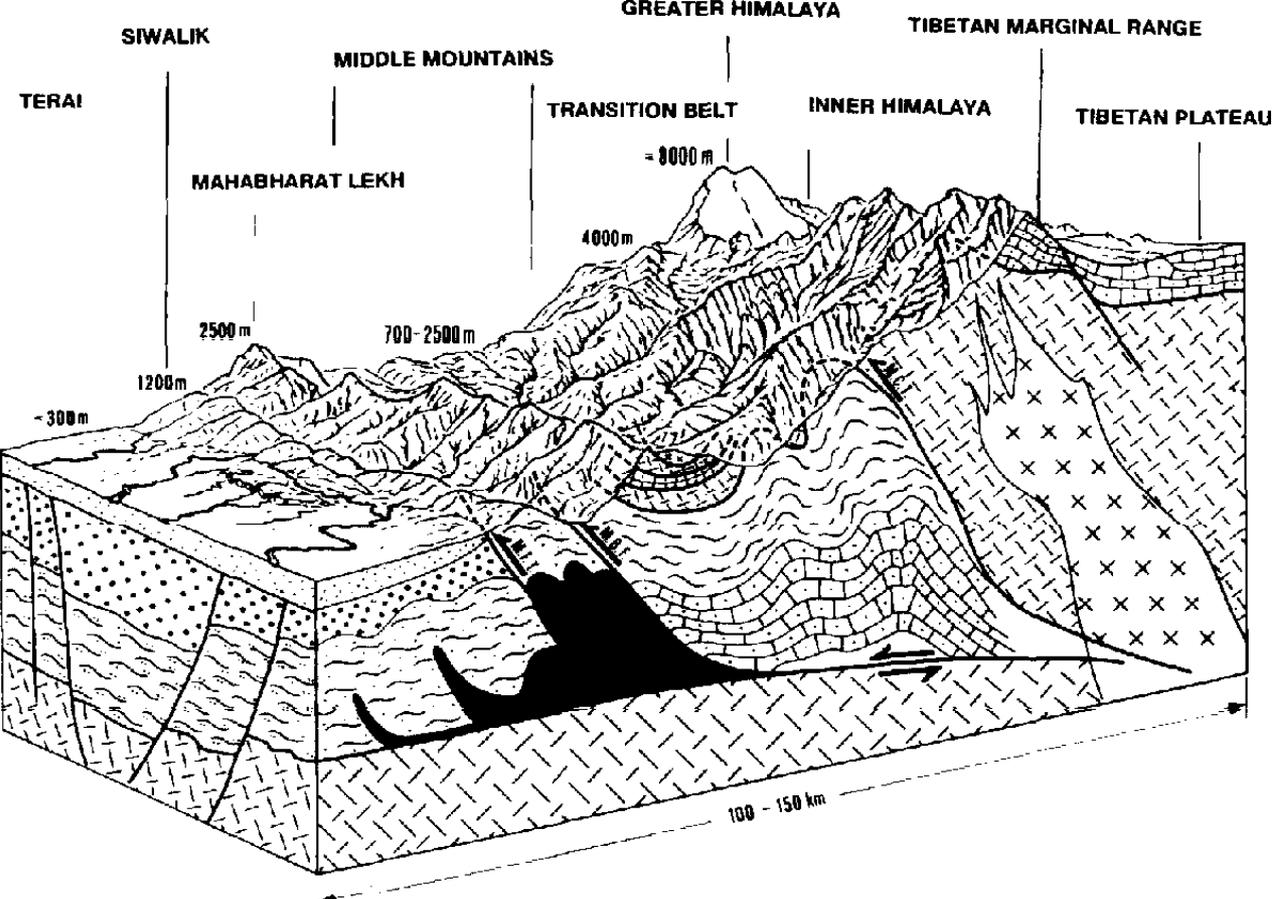


Le Fort, 1988

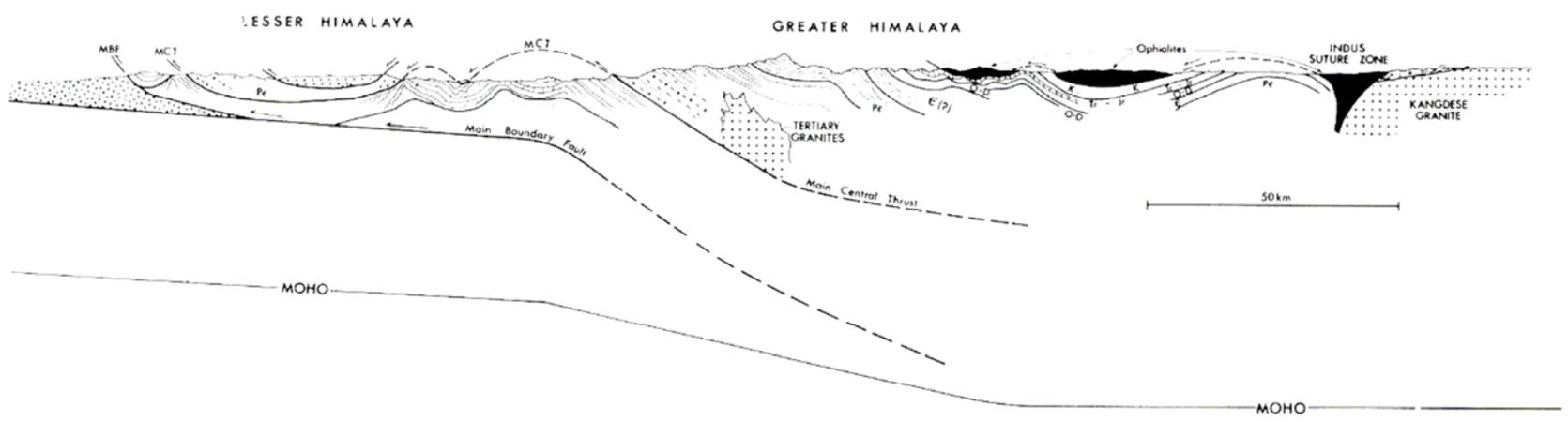


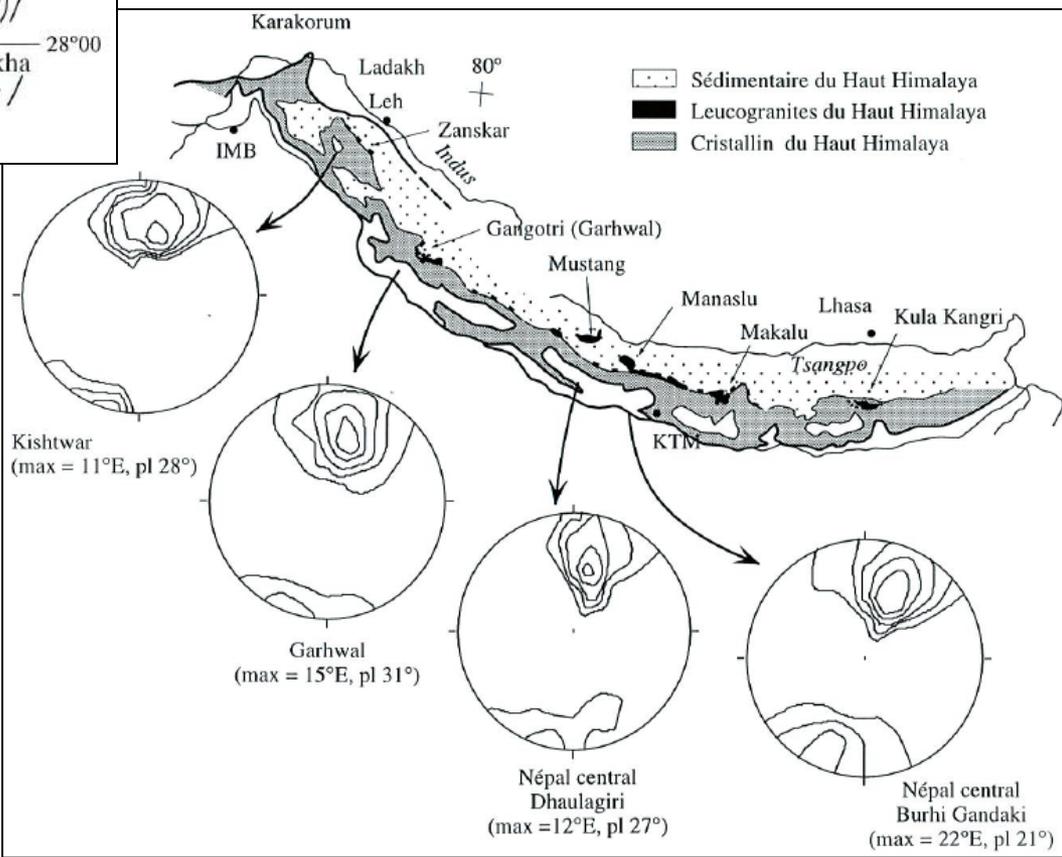
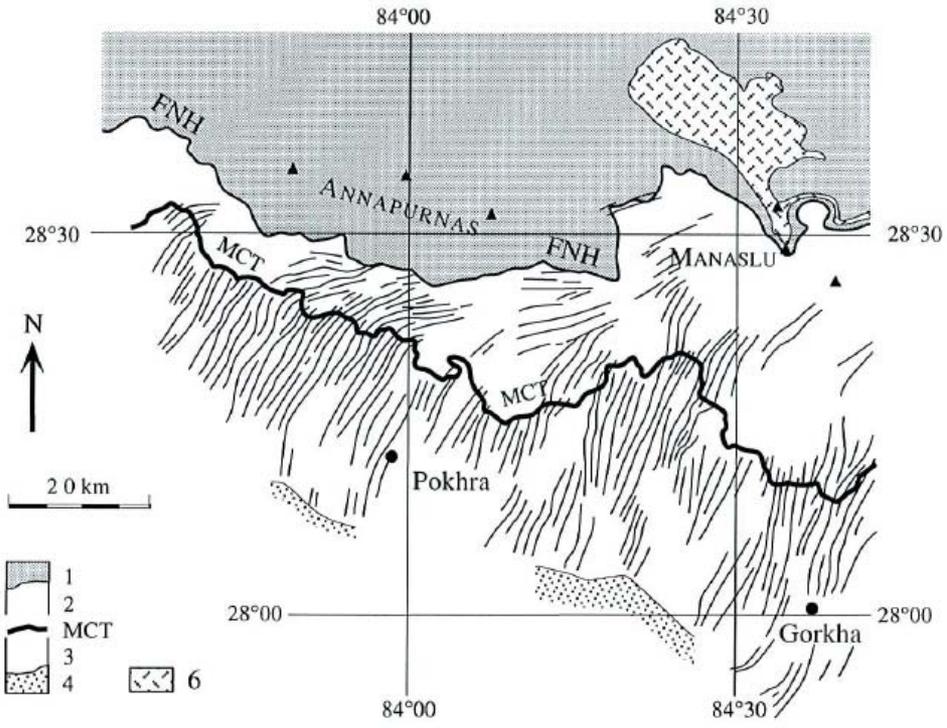
Dèzes, 1999



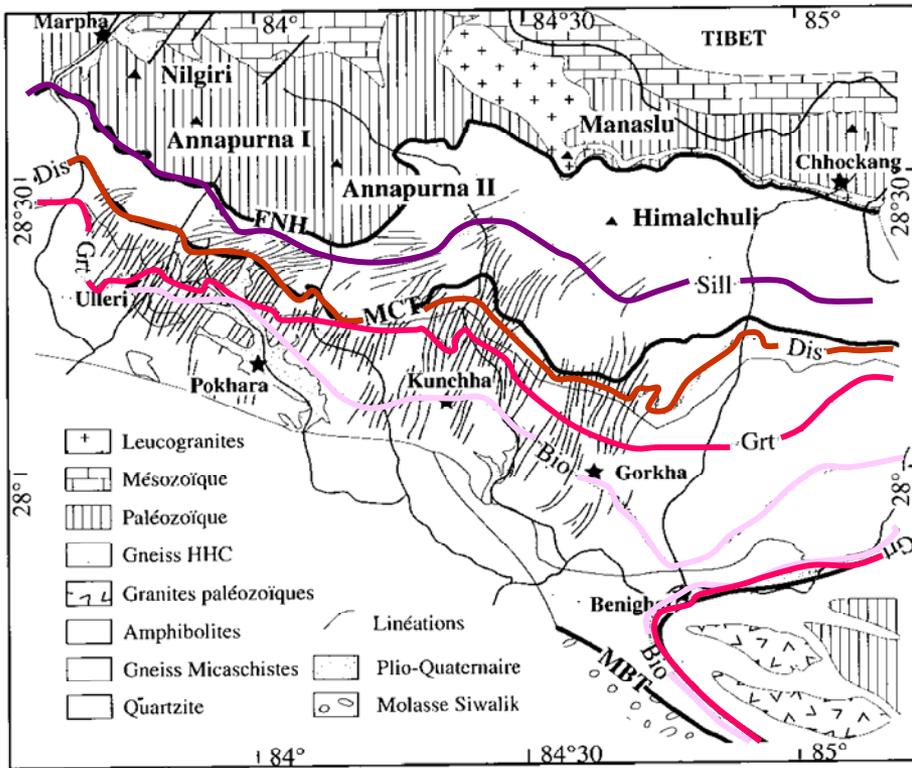


Litho-tectonic units		Rock type
	Quaternary	Alluvial sediments
	Upper	'Molasse' sandstone & shale
	Middle	
	Lower	
	Paleozoic and younger sediments of the lesser Himalaya	Schist & Limestone
	Paleozoic and younger sediments of the Higher Himalaya	Limestone & Marl
	Upper Precambrian and Lower Paleozoic sediments	Phyllite & Quartzite
	Lower Precambrian crystalline basement	Gneiss & Migmatite
	Tertiary Leucogranite	Tourmaline Granite
M.F.T.	Main Frontal Thrust	
M.B.F.	Main Boundary Fault	
M.C.T.	Main Central Thrust	

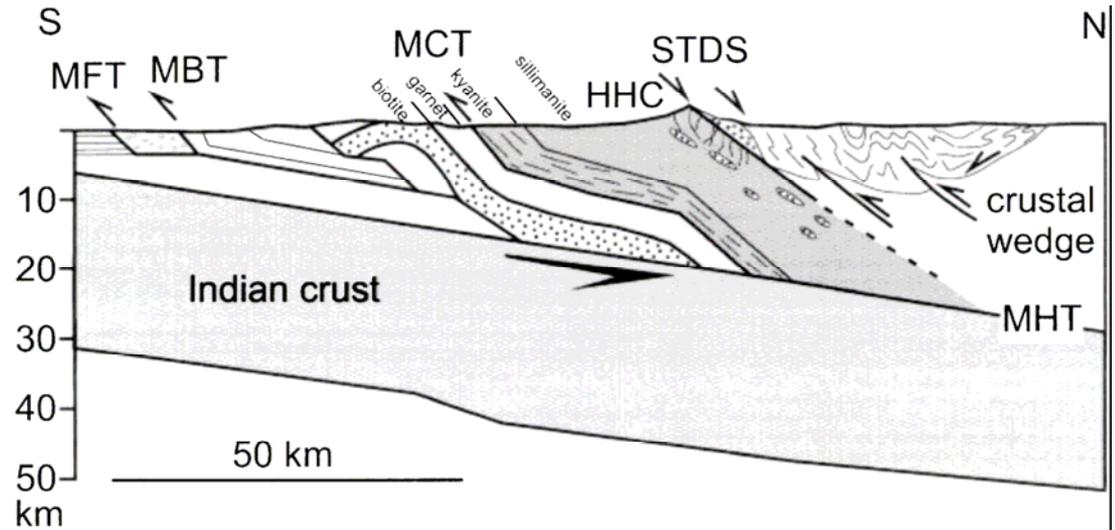
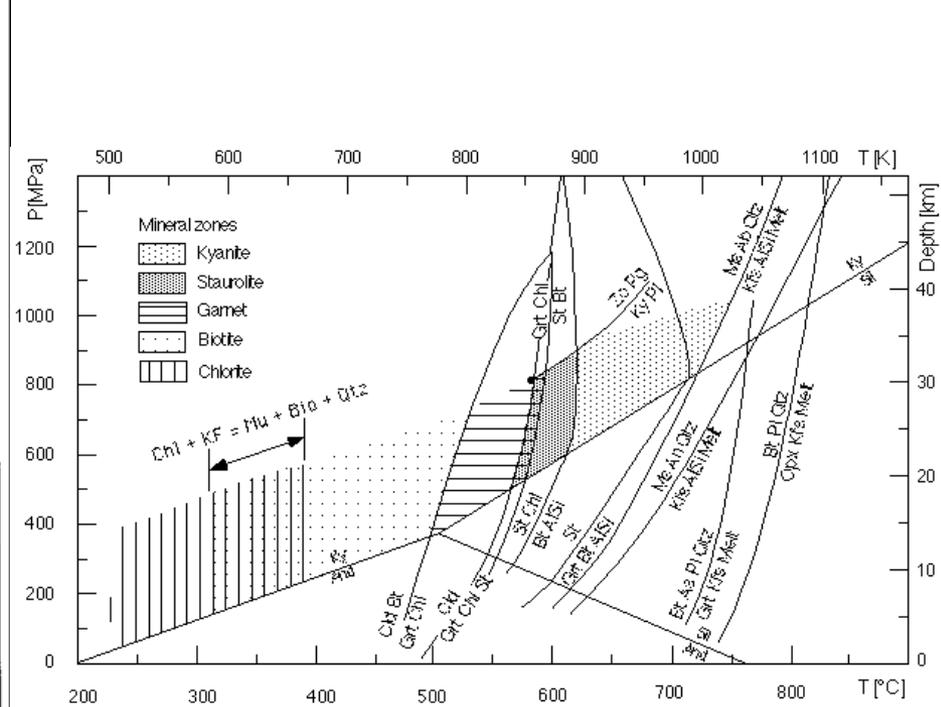




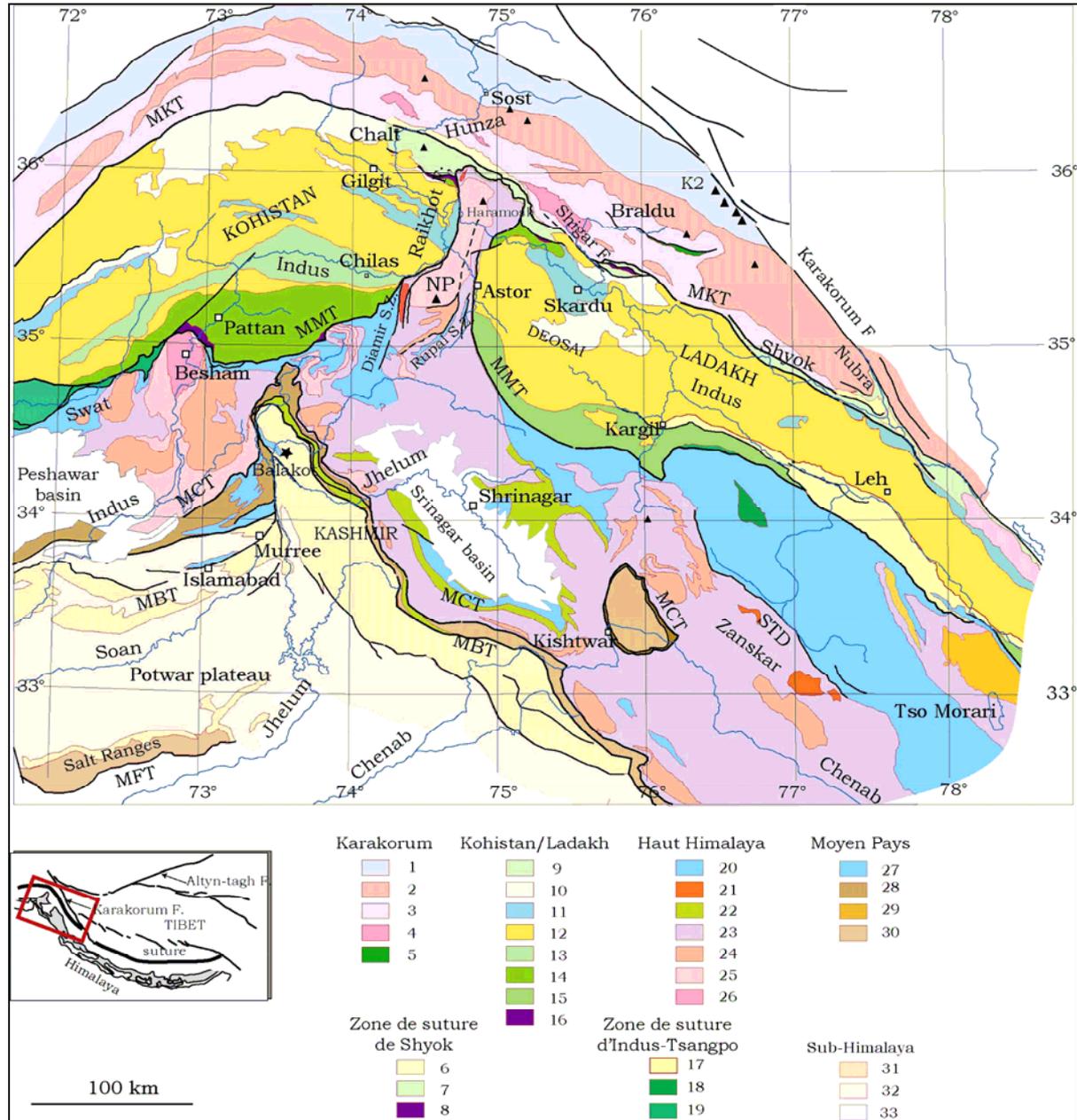
# Métamorphisme himalayen

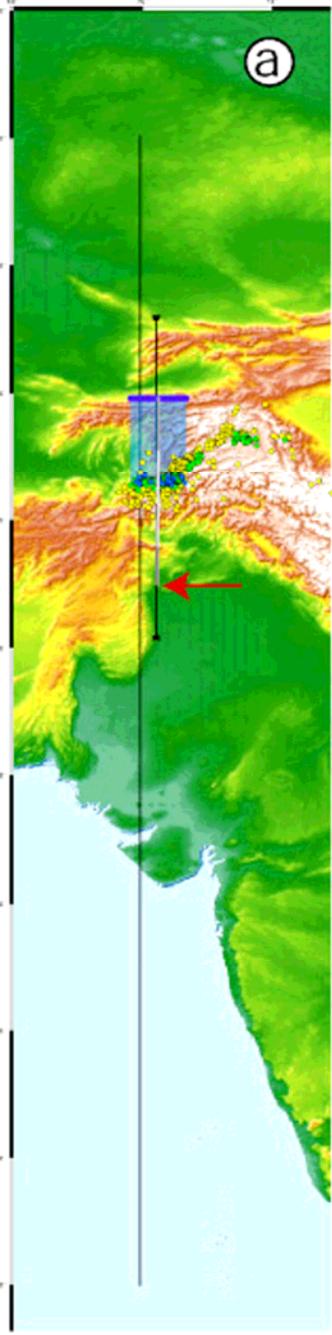


Cirio et al., 1996

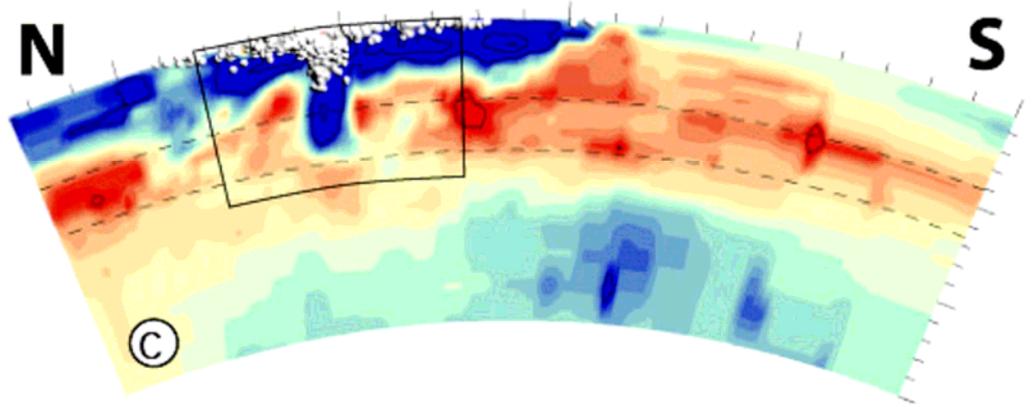
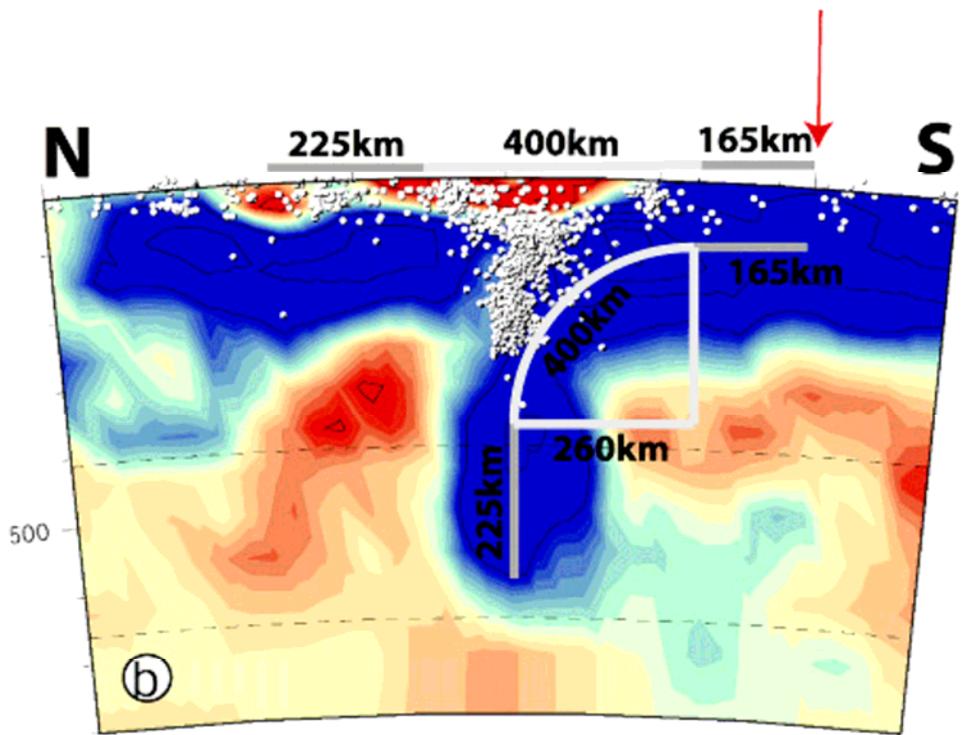


# La syntaxe NW: dynamique et géométries complexes





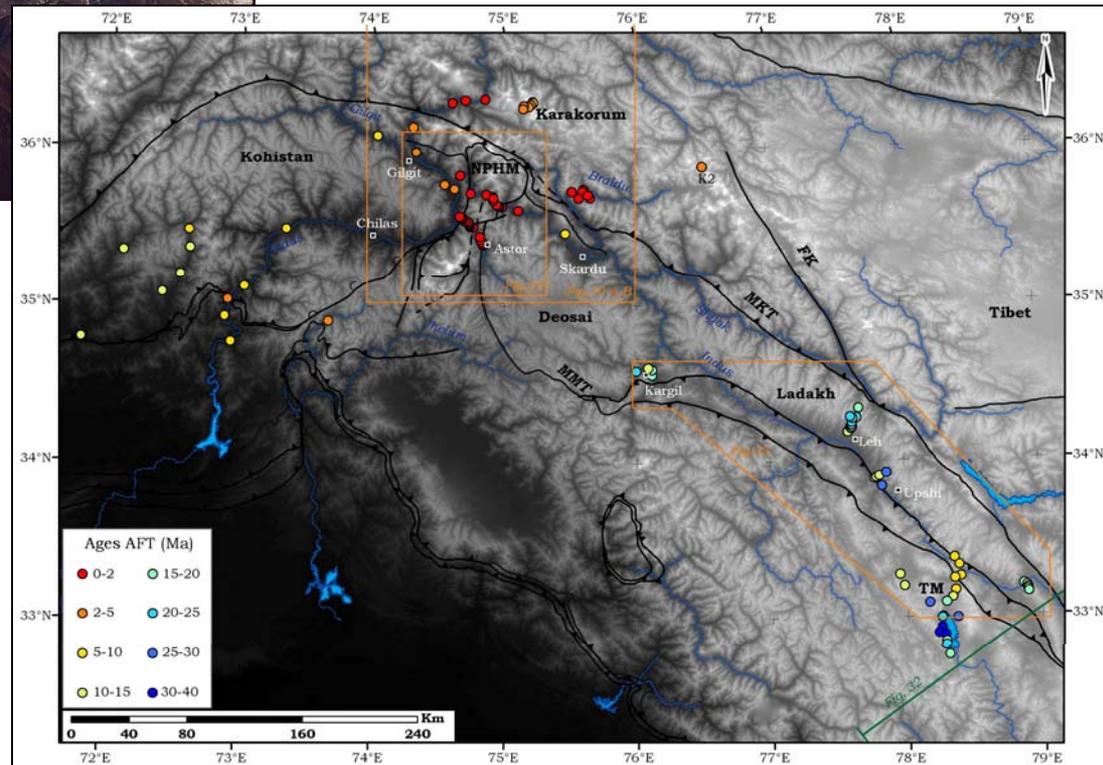
70°



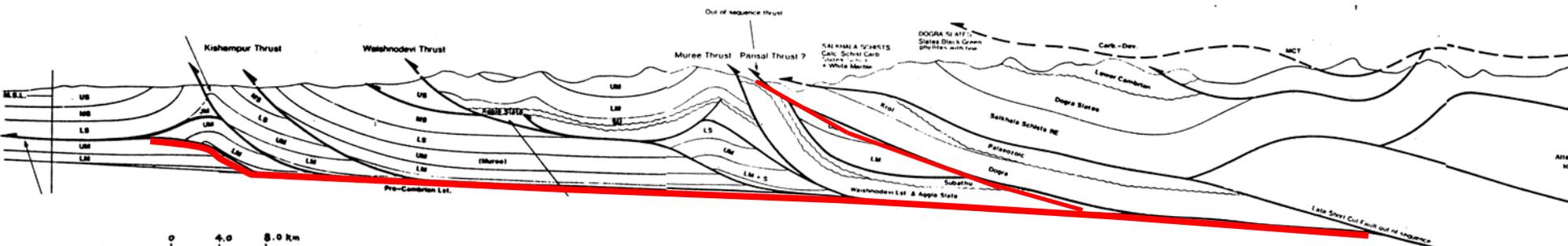
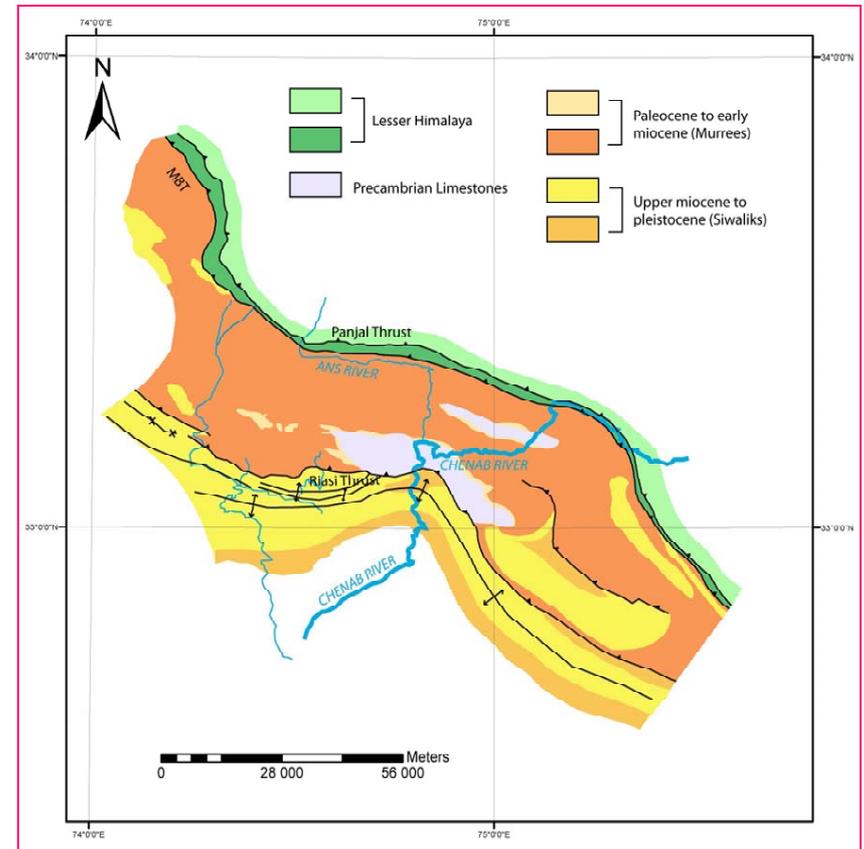
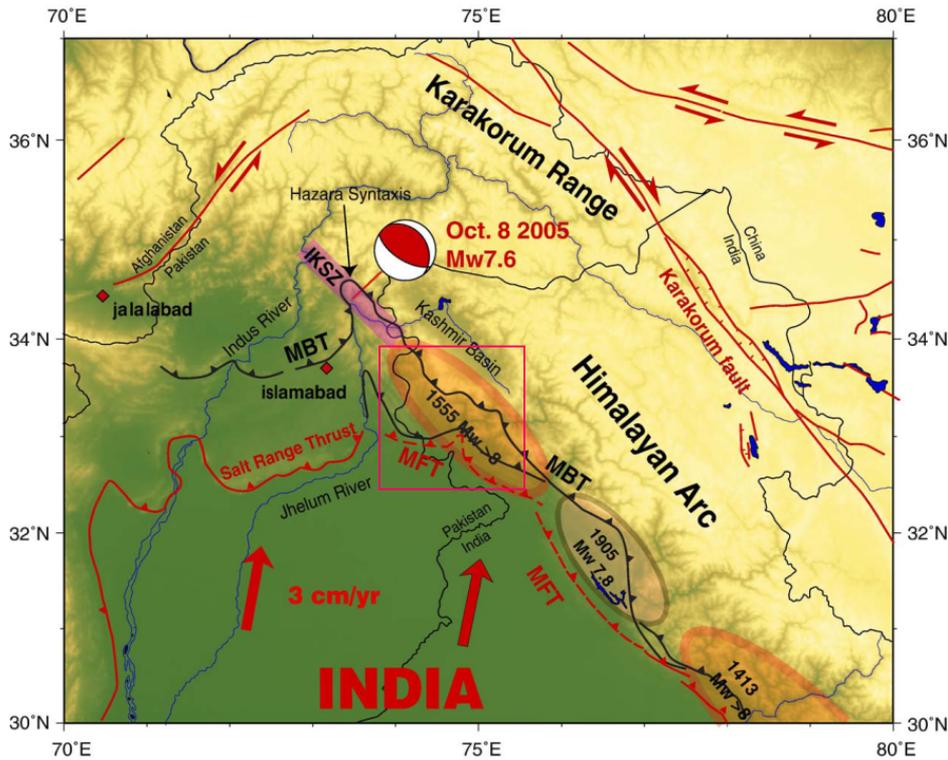
# Granite du Nanga Parbat



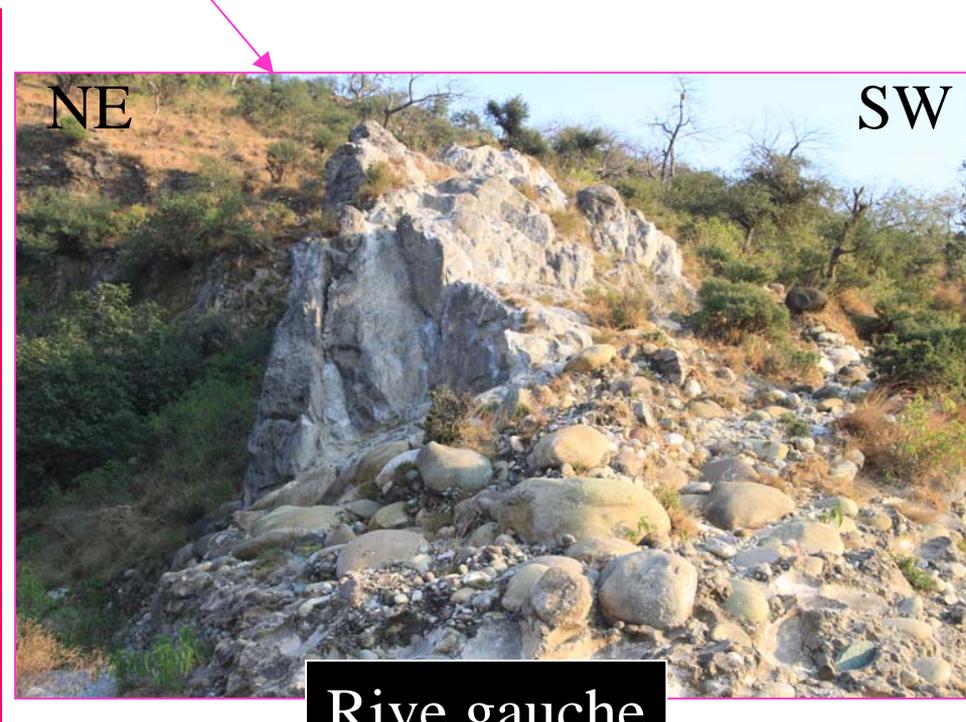
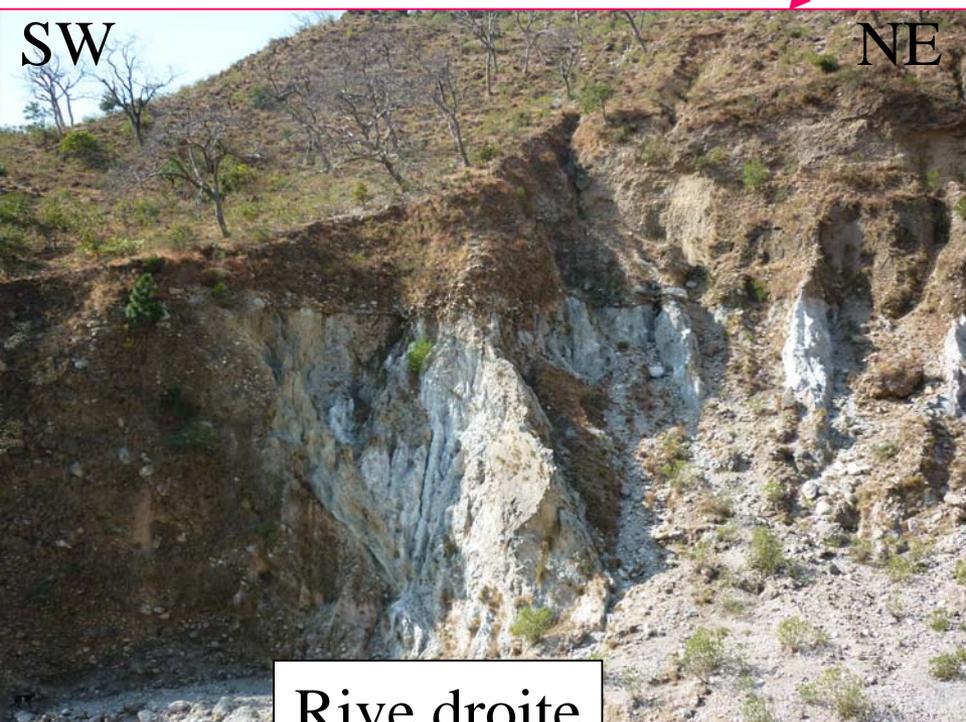
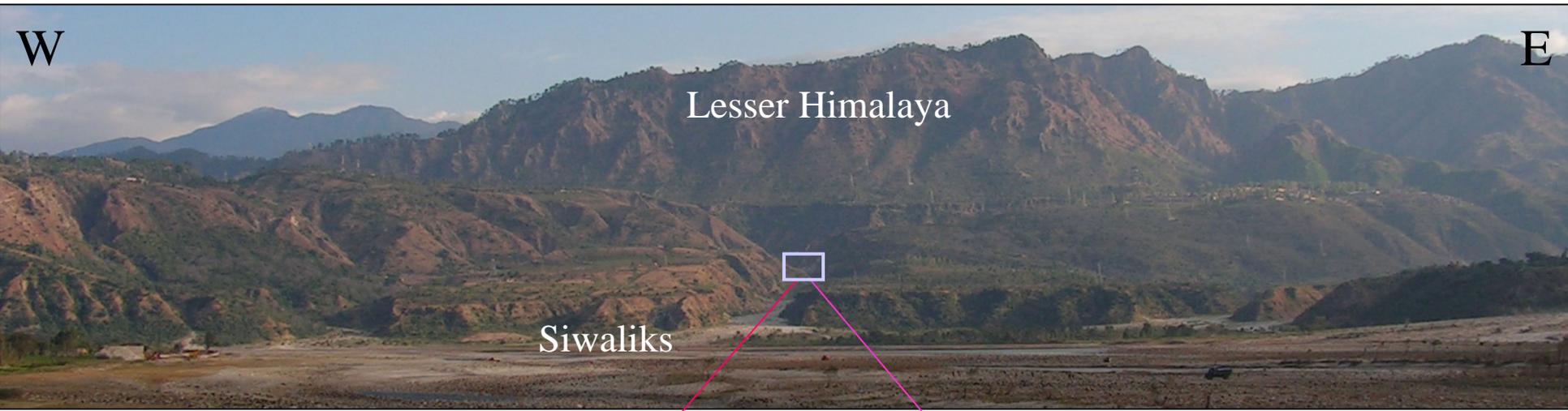
Ages Traces de Fission < 1 Ma  
Exhumation: 5-10 km/Ma !



# Front actif près de la syntaxe NW

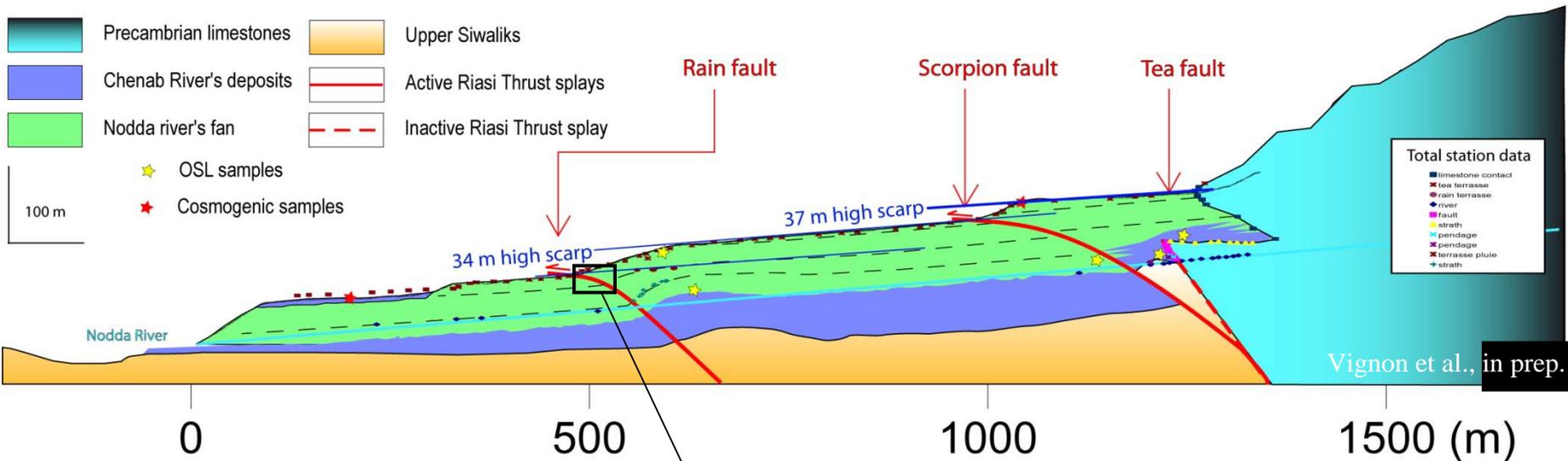


Vertical = Horizontal Scale 1:200,000



SW

NE

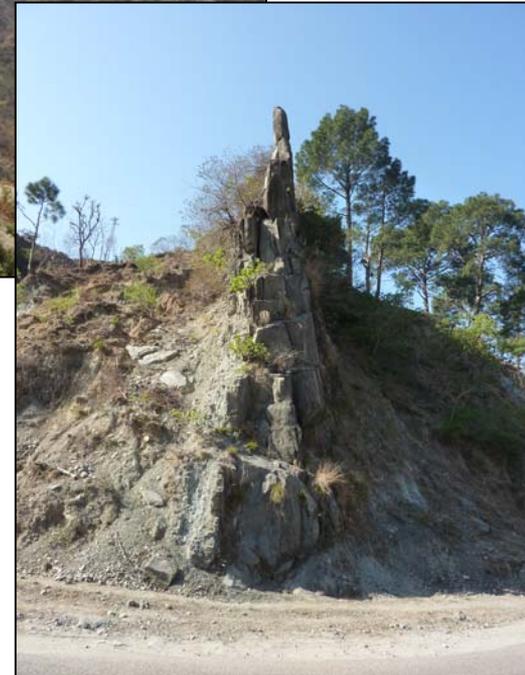


SW

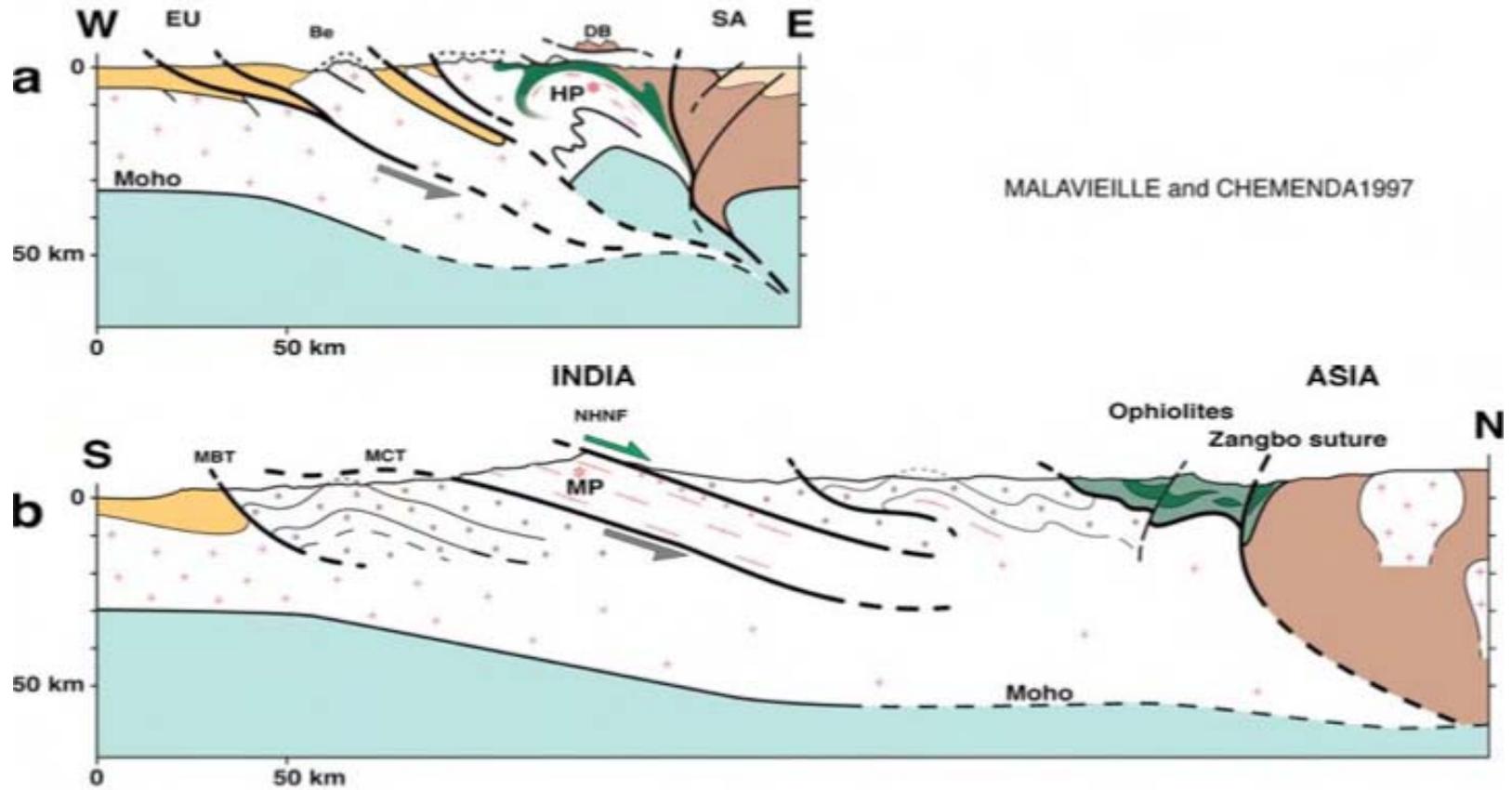
NE



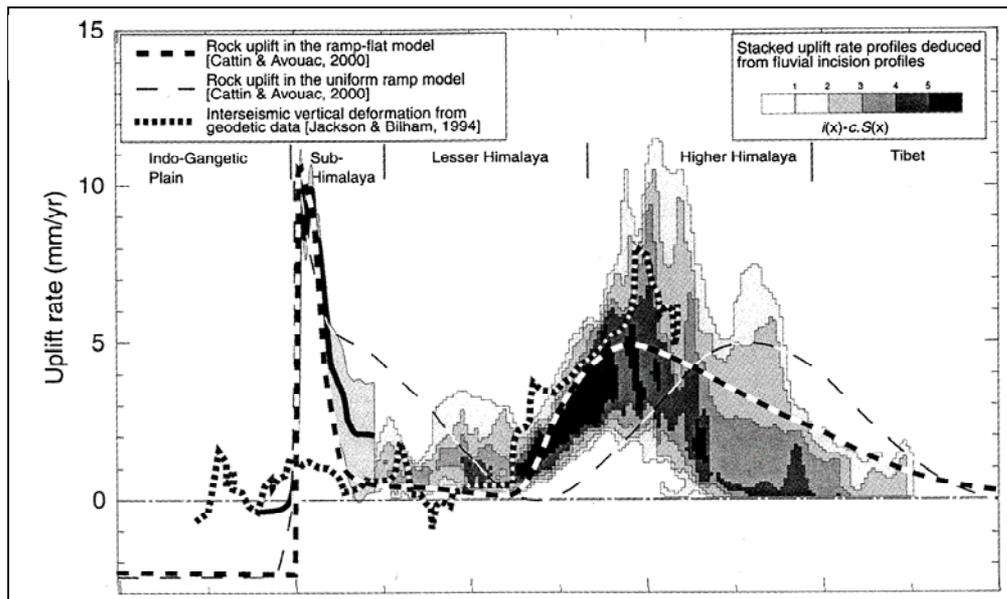
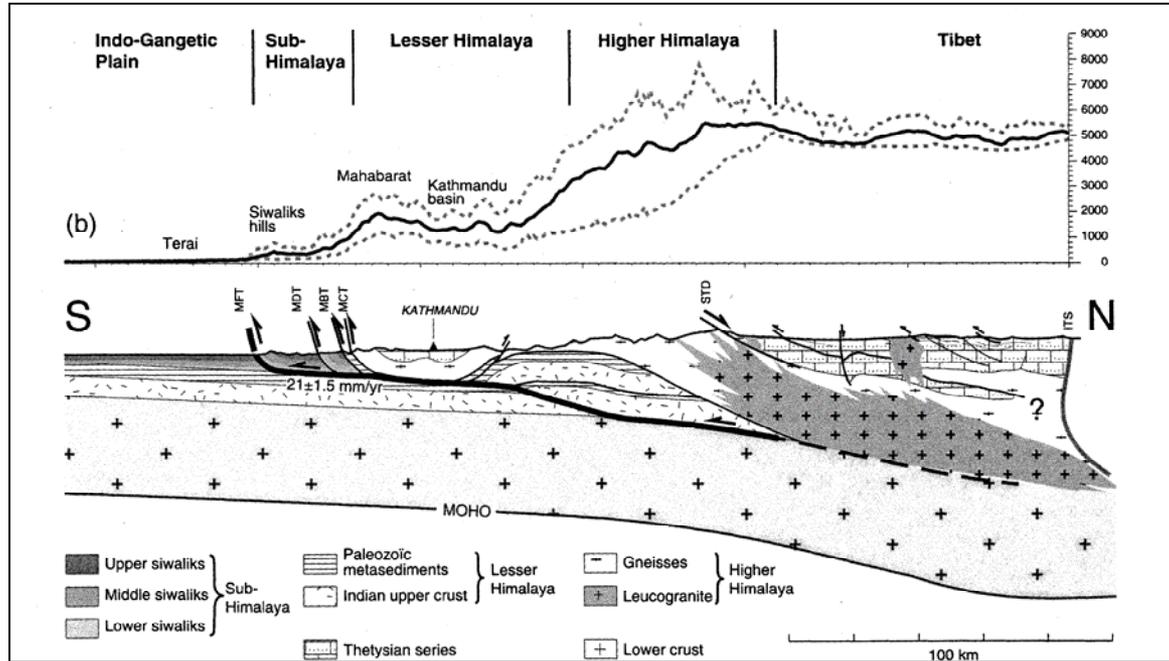
# Les Siwaliks : Molasses néogènes à quaternaires



# Alpes vs Himalaya



# Relief, structures et taux de surrection

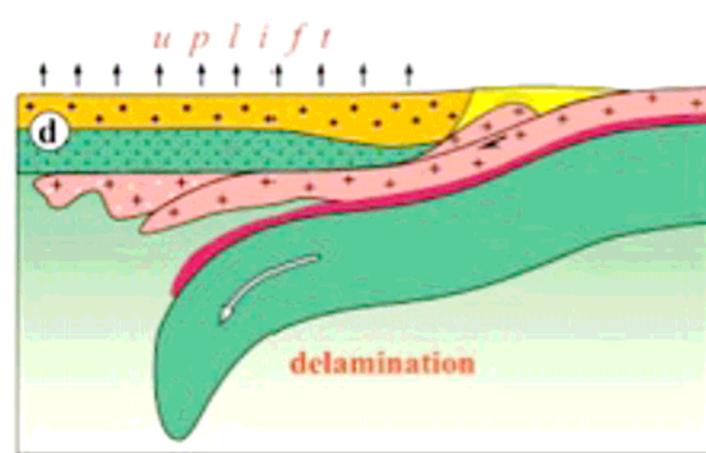


# Modèles géodynamiques



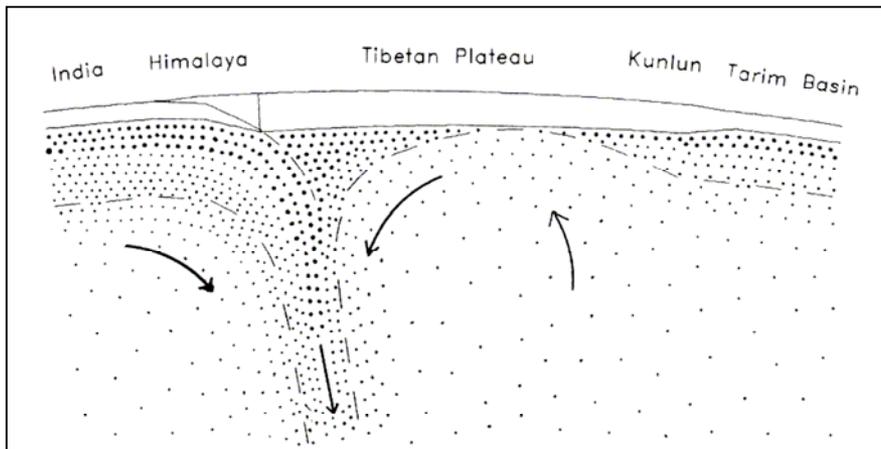
Extrusion de blocs lithosphériques

Peltzer & Tapponnier, 1988



Délamination mantellique

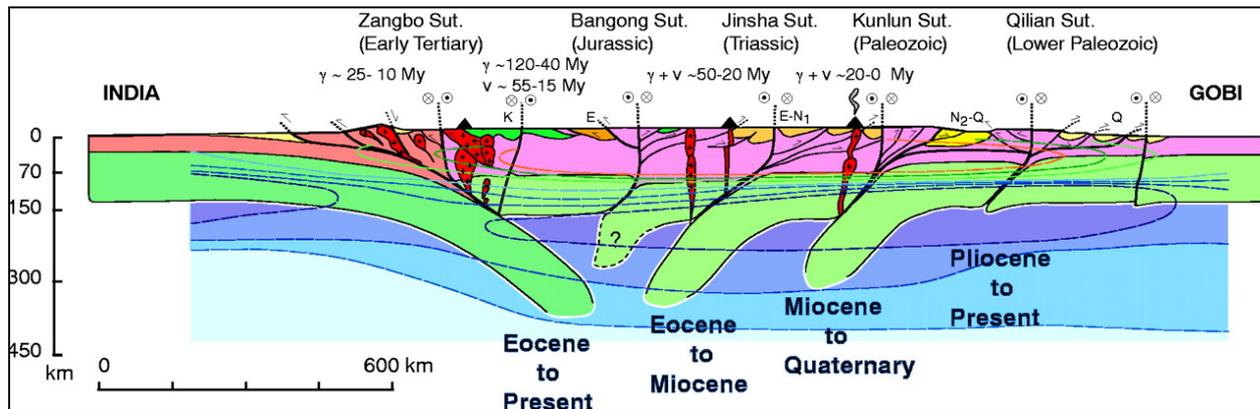
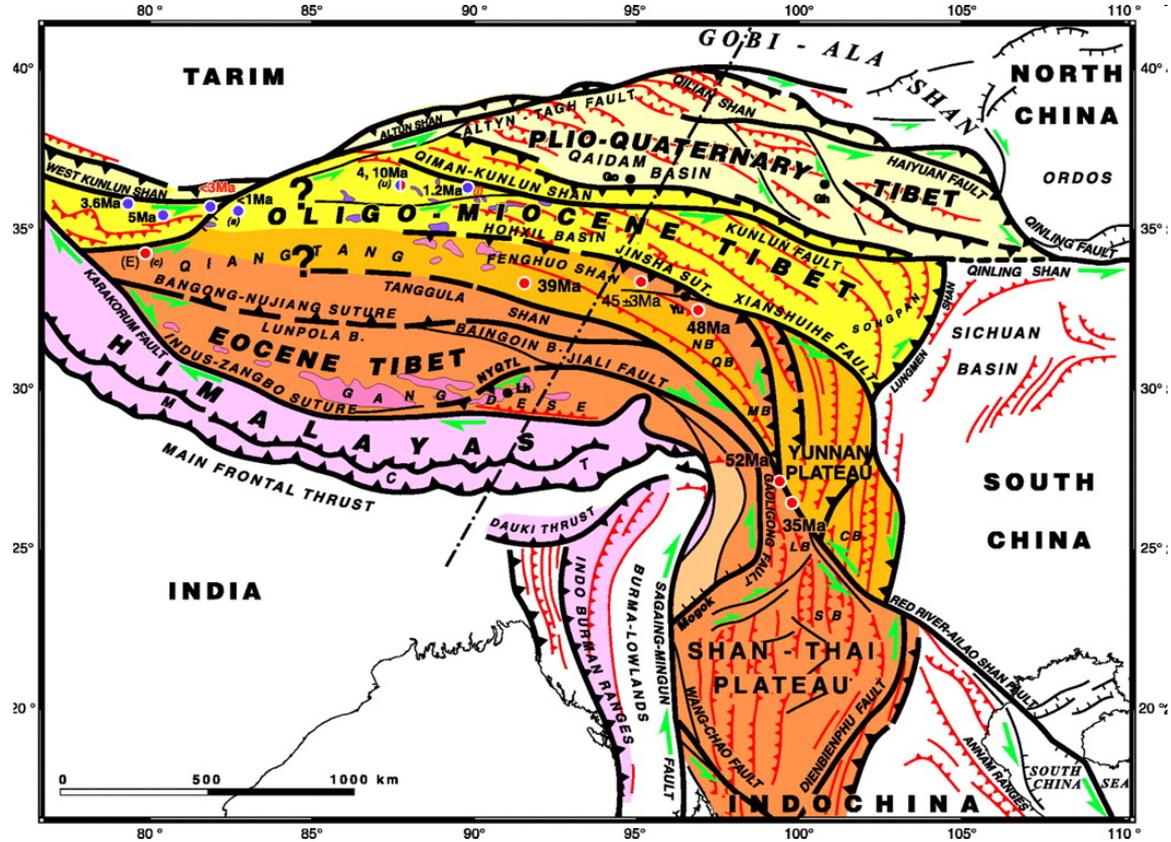
Chemenda et al., 2000



Convection asténosphérique induite

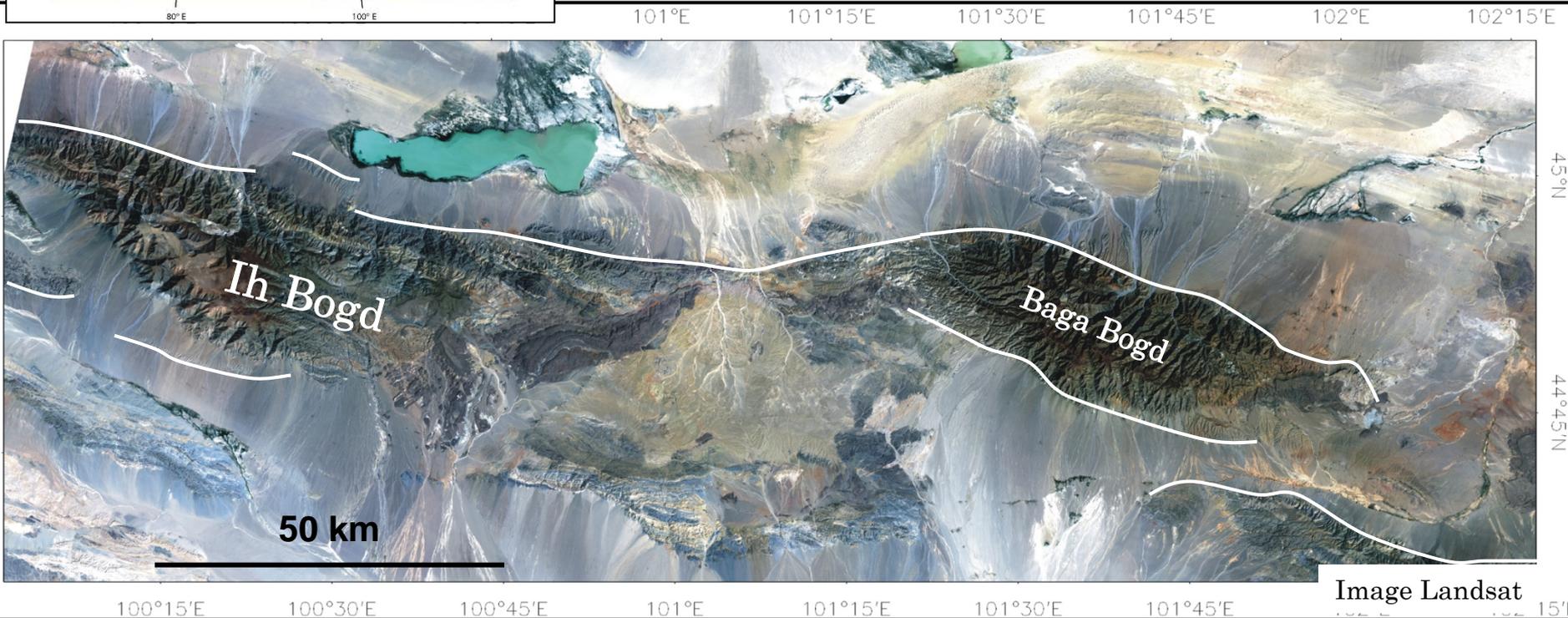
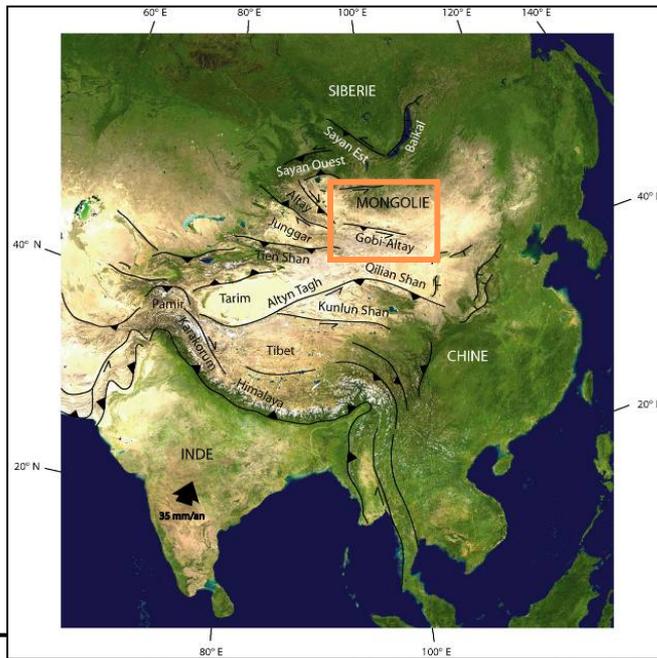
Molnar, 1988

# Propagation de la déformation vers le Nord



# Chaînes de l'Altay et du Gobi-Altay, Mongolie

## Déformation transpressive



# Séisme de Bogd: 1957, M 8.1; Rupture: 260 km

Déplacement horizontal moyen : 5 m

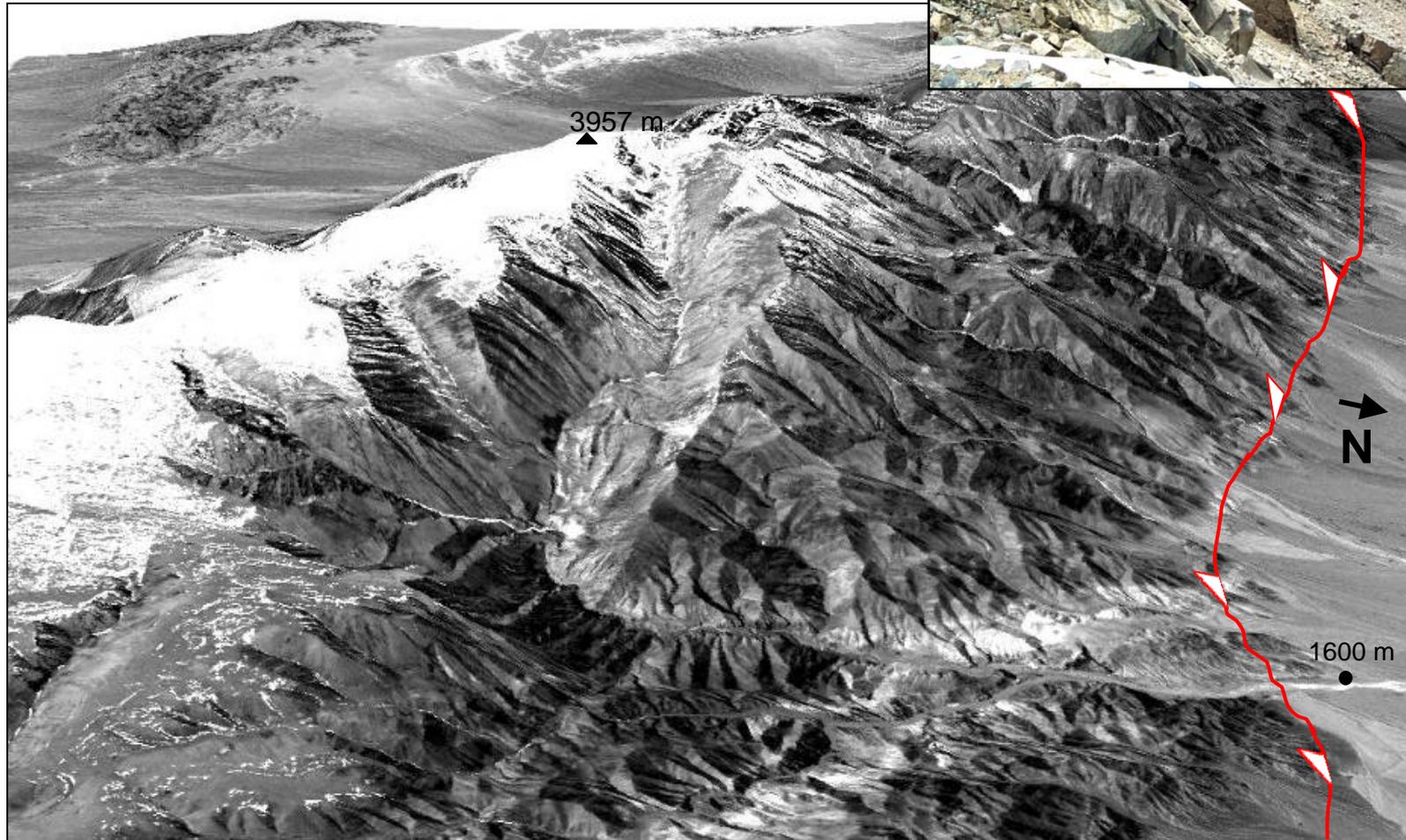


Déplacement vertical moyen : 2 m

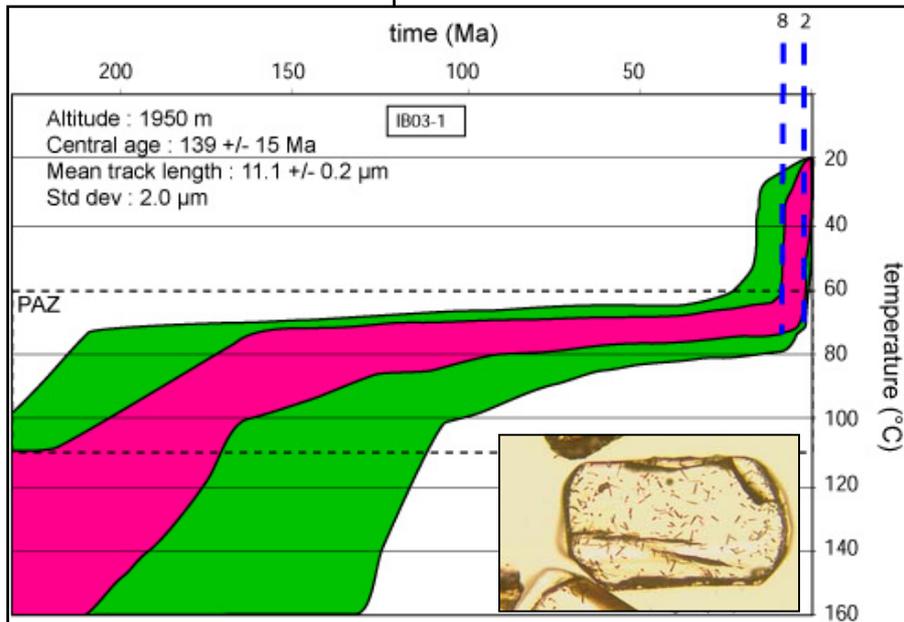
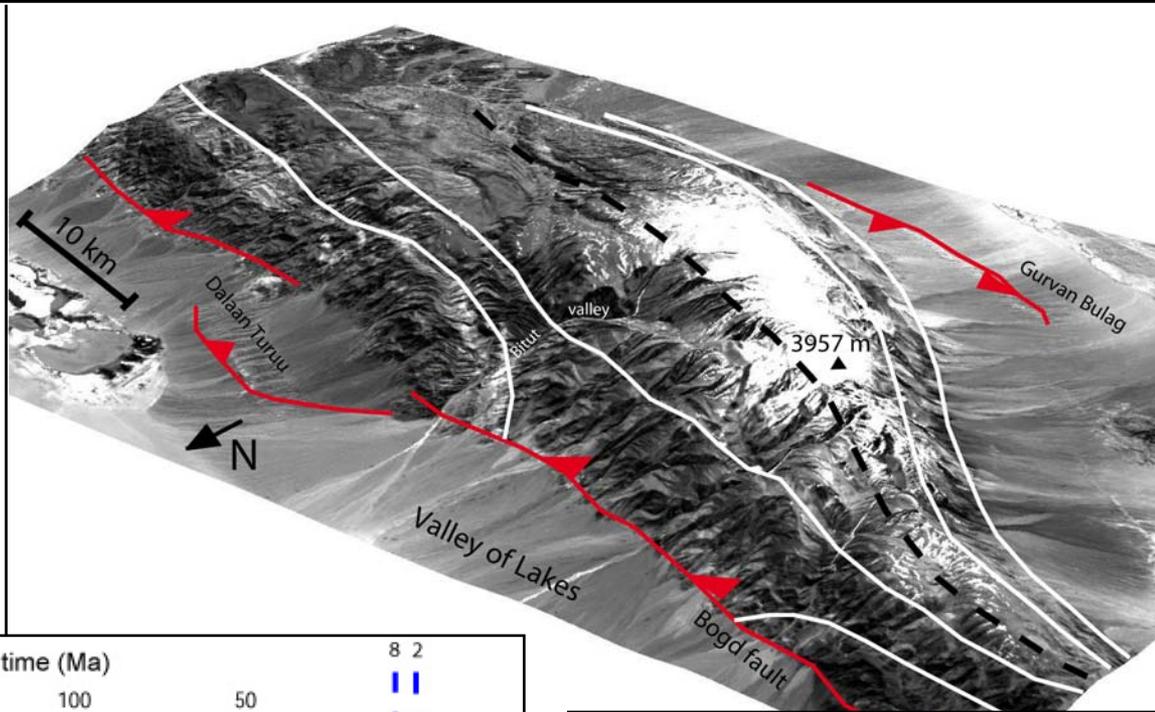
Séisme de Bolnay: 1905, M 8.4  
Rupture: 400 km; Mouvement horizontal: 9 m



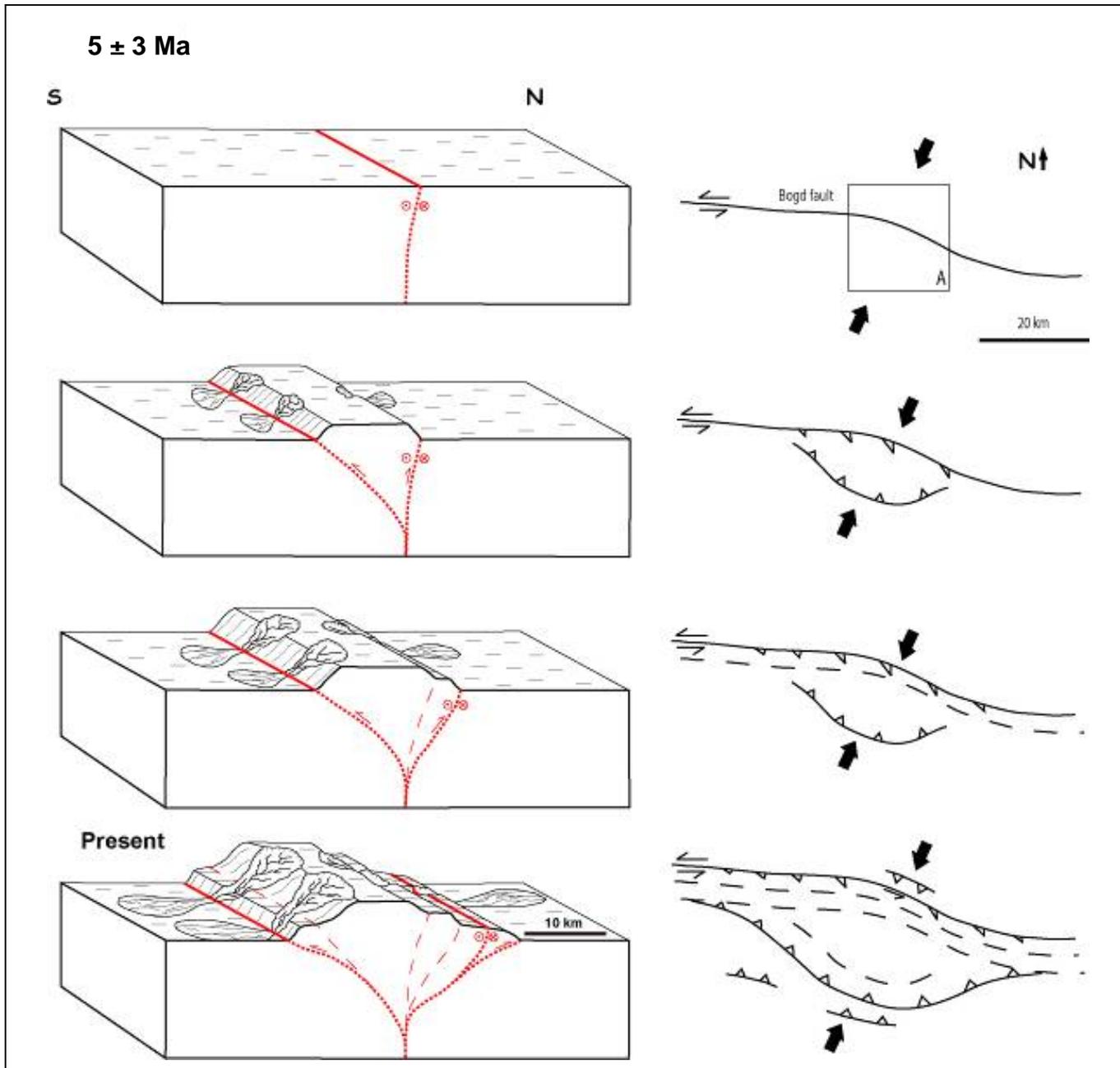
# Pénéplaine soulevée et préservée: Reliefs « jeunes »



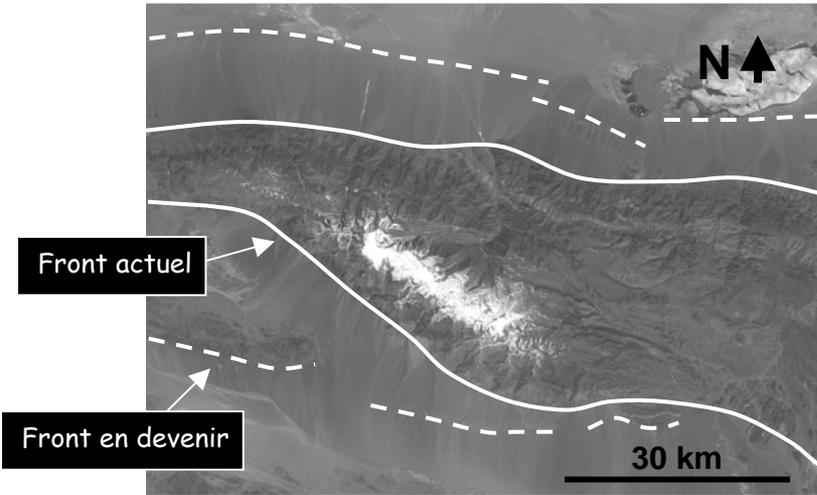
# Age et vitesse de la surrection des massifs



# Ih Bogd: « modèle réduit » d'Himalaya



# Evolution future du Gobi-Altay



Croissance latérale des massifs jusqu'à leur coalescence

Exemple de l'Altay

