

**UNIVERSITE MOULAY ISMAIL - FACULTE DES SCIENCES  
DEPARTEMENT DE GEOLOGIE**

**MASTER SPECIALISE GEOSCIENCES APPLIQUEES.**

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**ANALYSE STRUCTURALE  
DES ZONES  
EN DECROCHEMENT**

Pr. Lakhlifi Badra / 2020.

# PLAN

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Les principales composantes

Les blocs : morphologie et déplacement

Formation des fractures courbes

Les structures conséquentes

Ordre des fractures

Les rapports angulaires





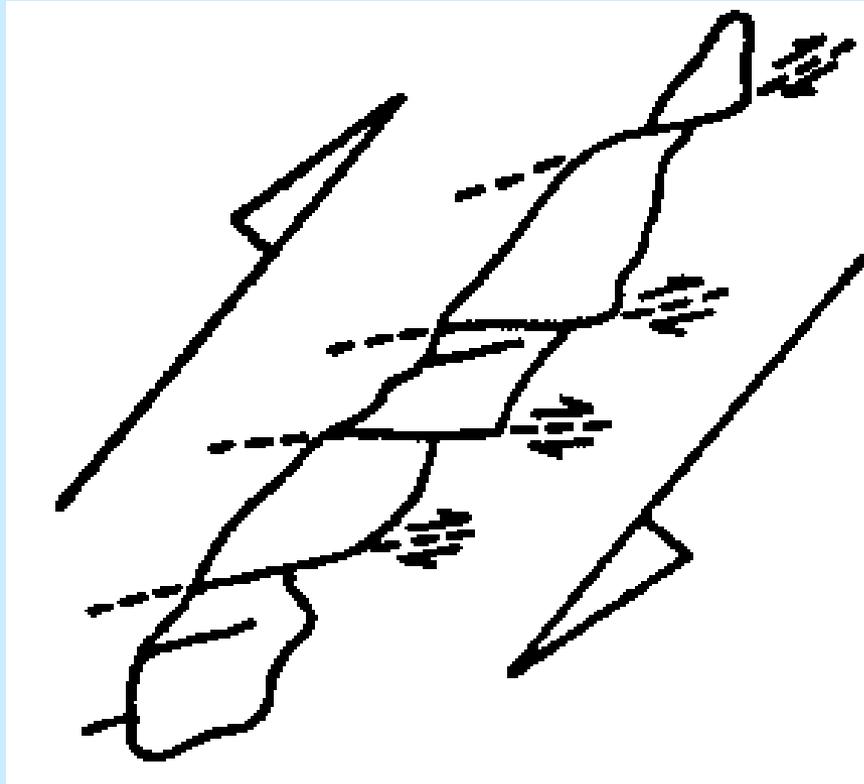
# LES BLOCS

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Forme  
&  
déplacement

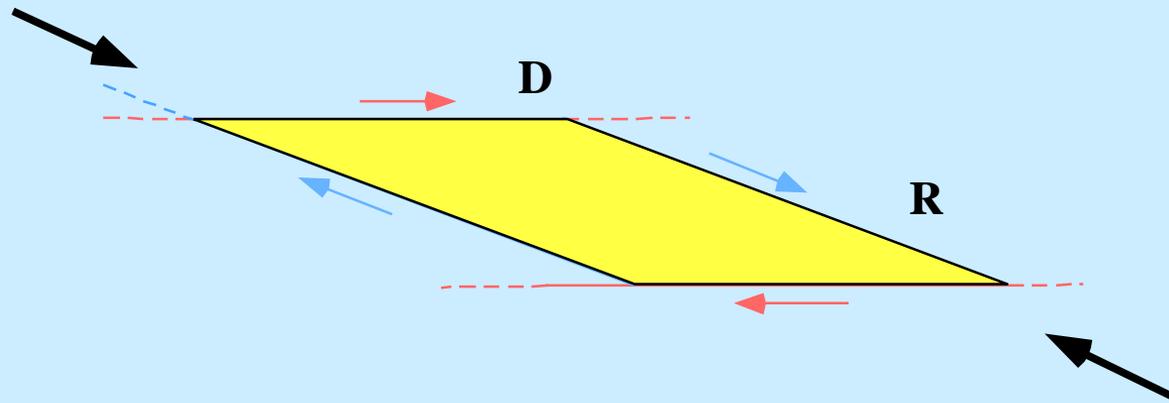
# Blocs tectoniques

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Découpage par cisaillements élémentaires.

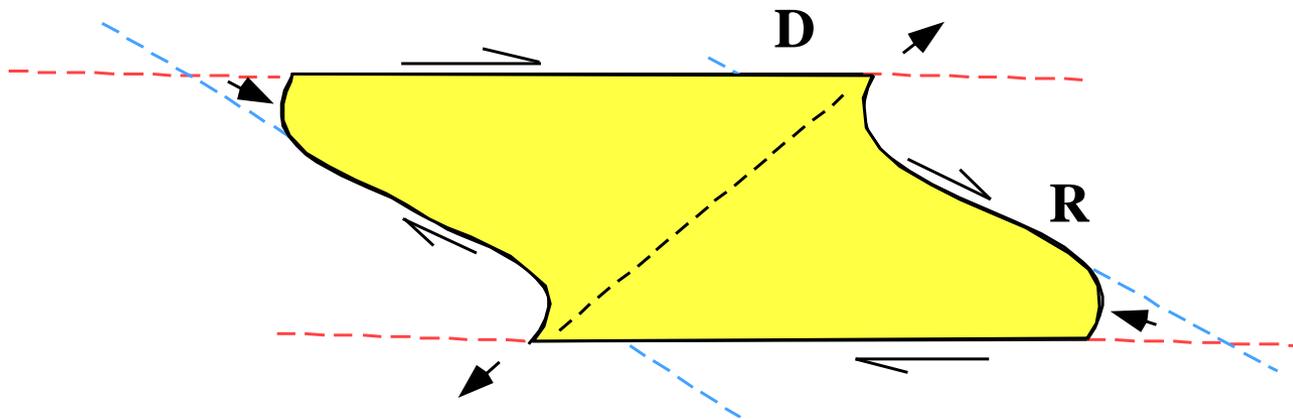
# DEFORMATION DES BLOCS



Bloc défini par les plans D et R

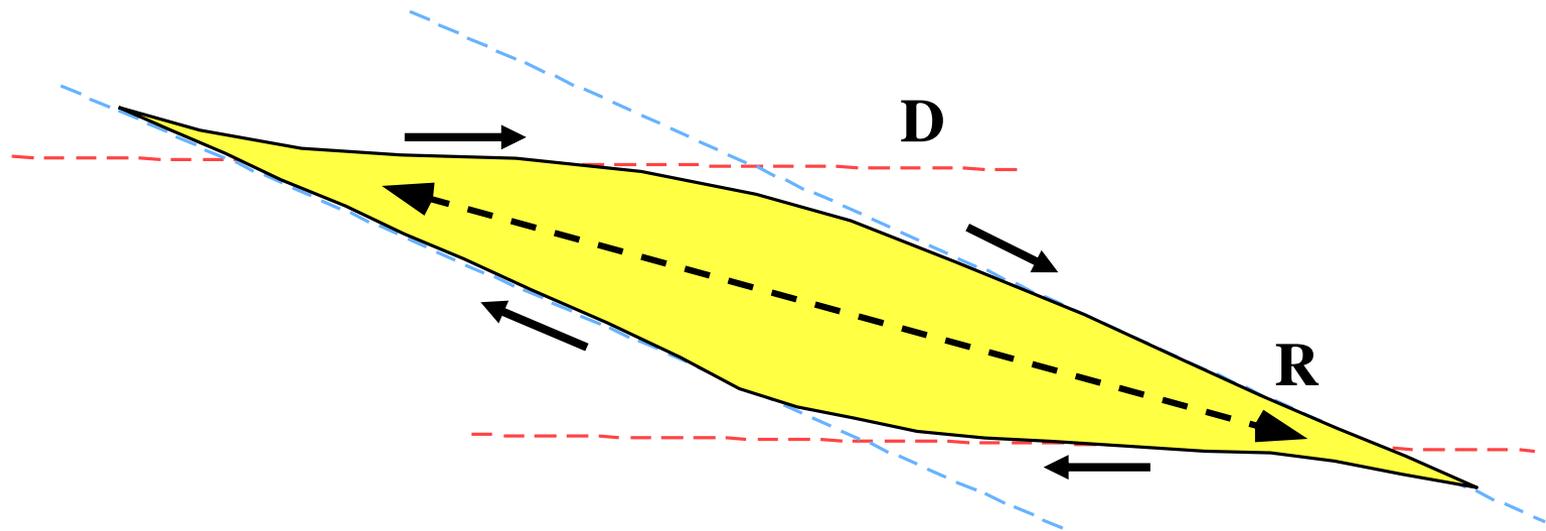
# DEFORMATION DES BLOCS

- DEFORMATION SUIVANT UN PLAN DOMINANT (D).

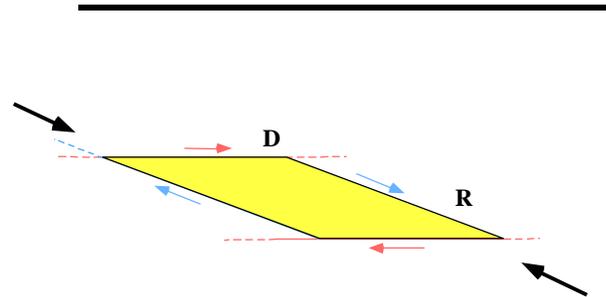


# DEFORMATION DES BLOCS

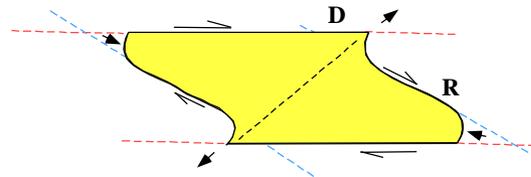
- STADE DE DEFORMATION AVANCEE.



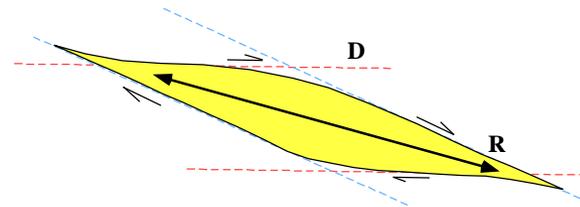
# DEFORMATION DES BLOCS



BLOC DÉFINI PAR LES PLANS D ET R



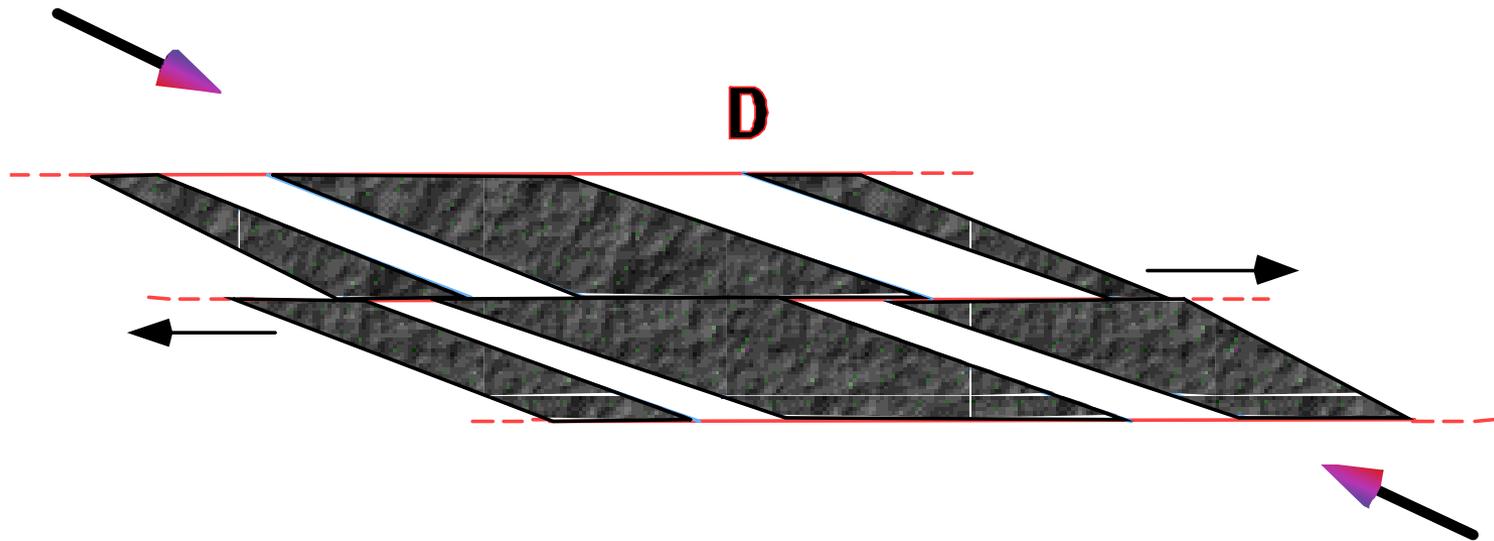
DÉBUT DE DÉFORMATION PAR CISAILLEMENT  
(principalement suivant les plans D)



STADE DE DEFORMATION AVANCÉE  
(étirement parallèlement aux plans R)

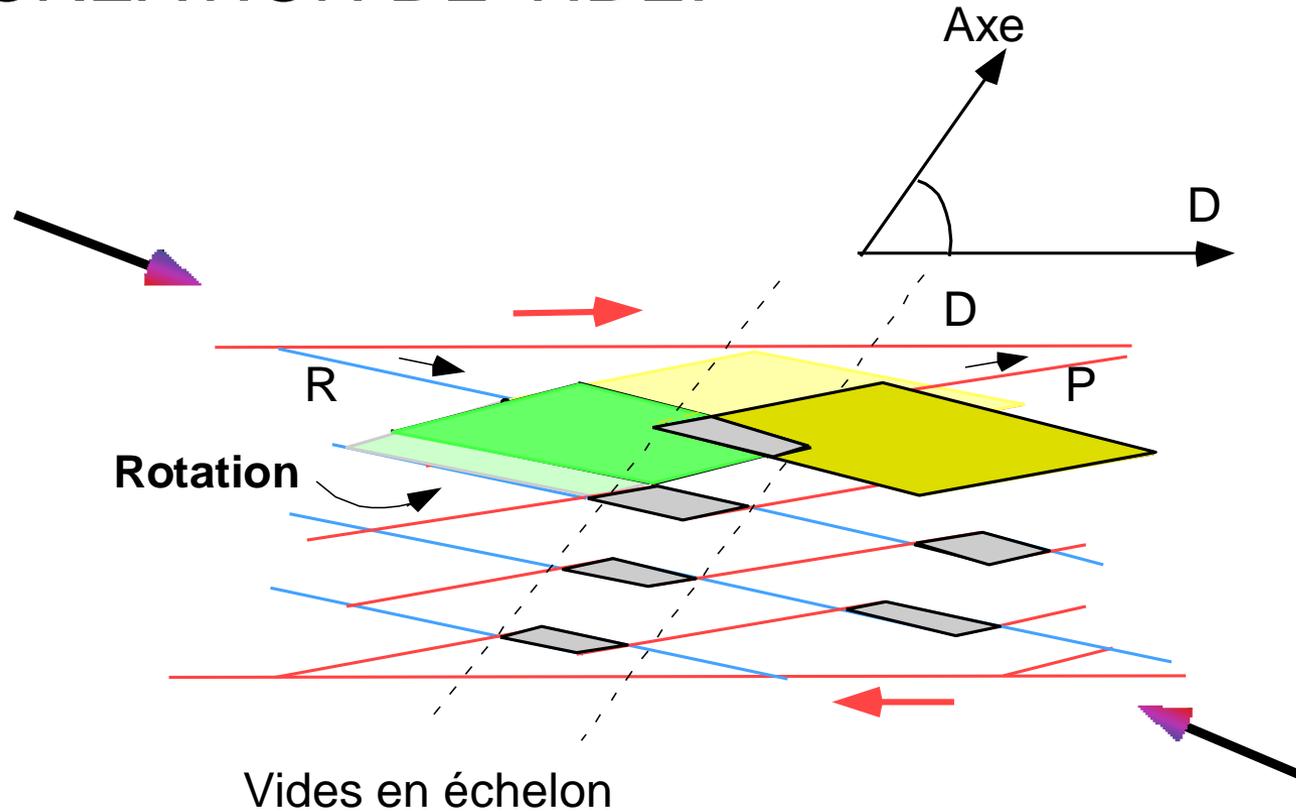
# DEPLACEMENT DES BLOCS

- SUIVANT UN PLAN



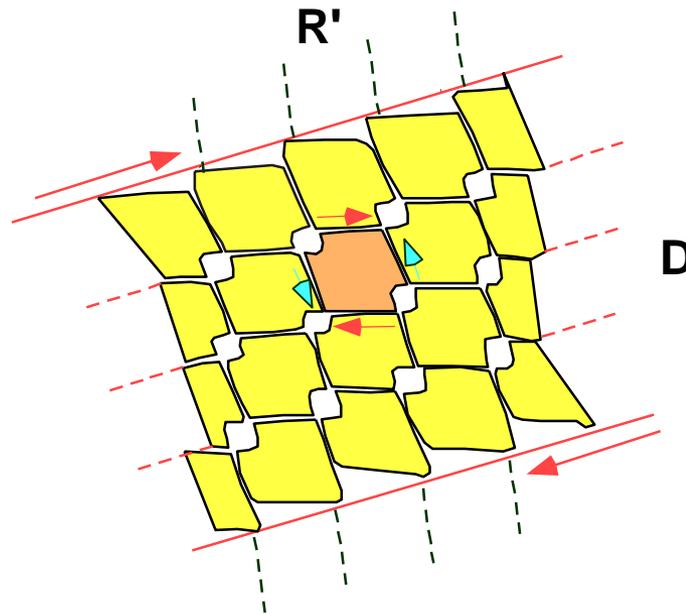
# DEPLACEMENT DES BLOCS.

- CREATION DE VIDE.



# MOUVEMENTS DES BLOCS

- CREATION DE VIDES PAR DEPLACEMENT ET ROTATION DES BLOCS.



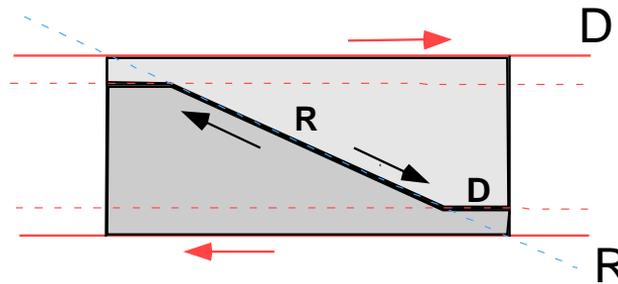
# LES FRACTURES COURBES

# FORMATION DE FRACTURES COURBES

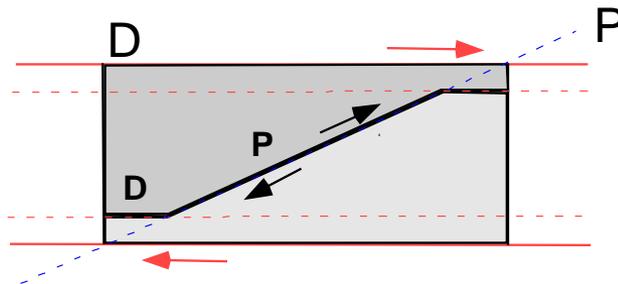
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→ Par conjonction de fractures.

**A**  
**Extension**



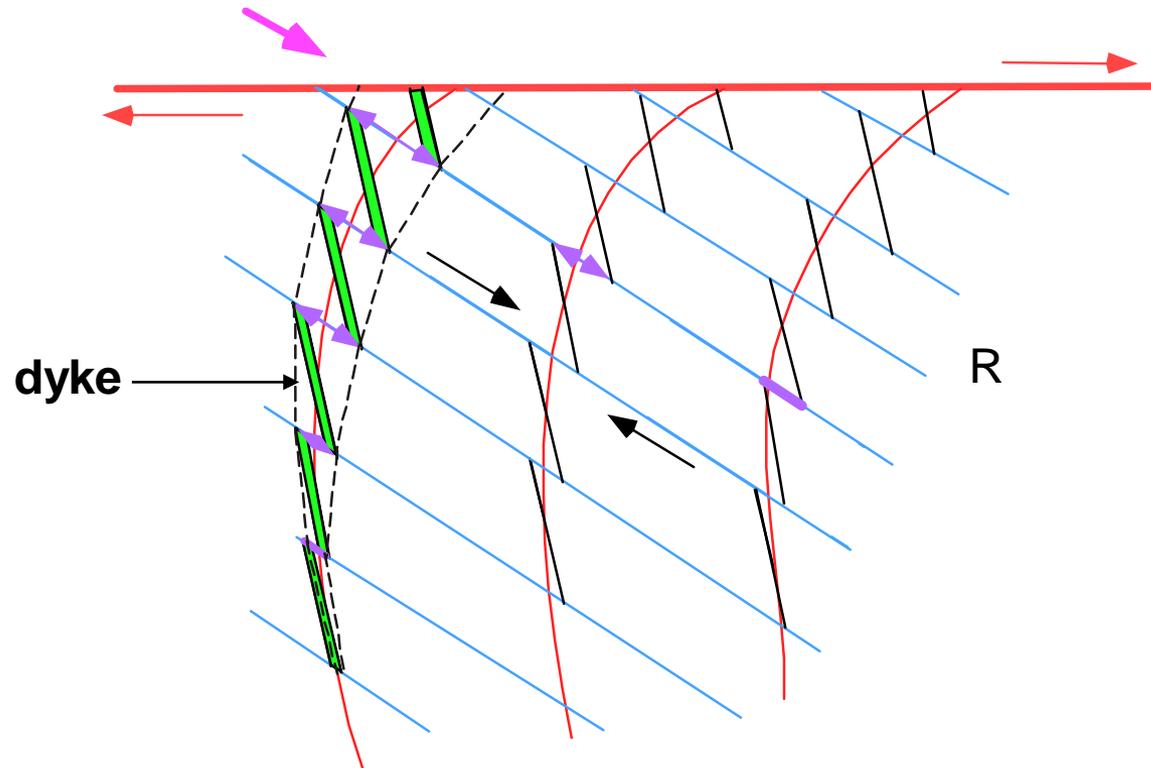
**B**  
**Compression**



# FORMATION DE FRACTURES COURBES

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- Selon l'intensité du glissement.

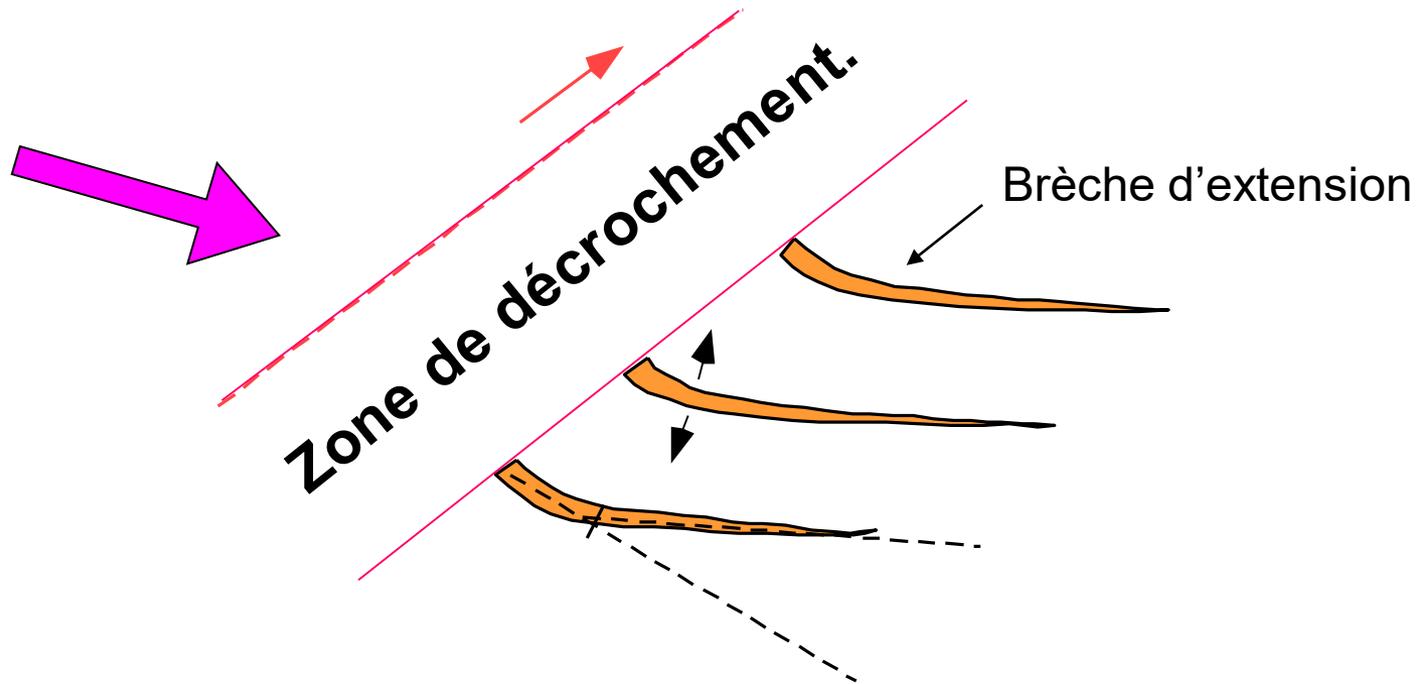


# STRUCTURES CONSEQUENTES

# OUVERTURE

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- Fentes de tension.

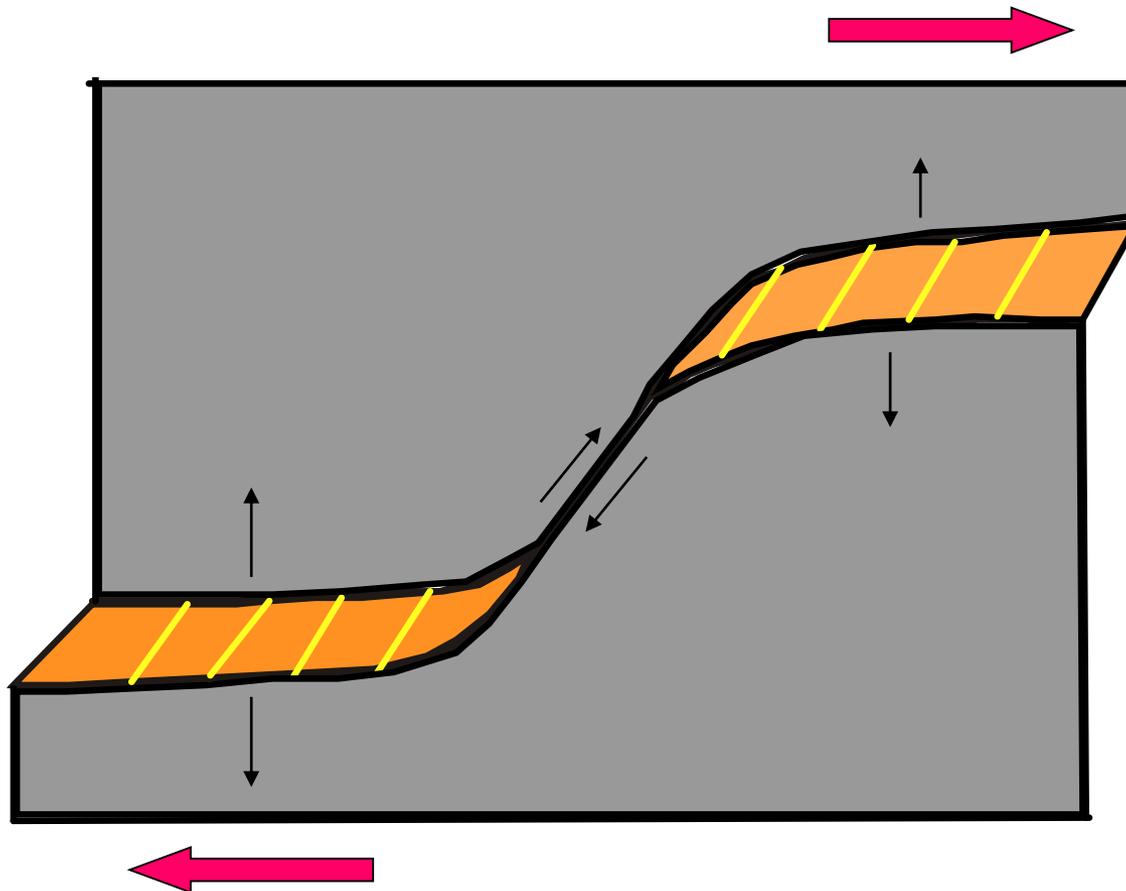




# OUVERTURE

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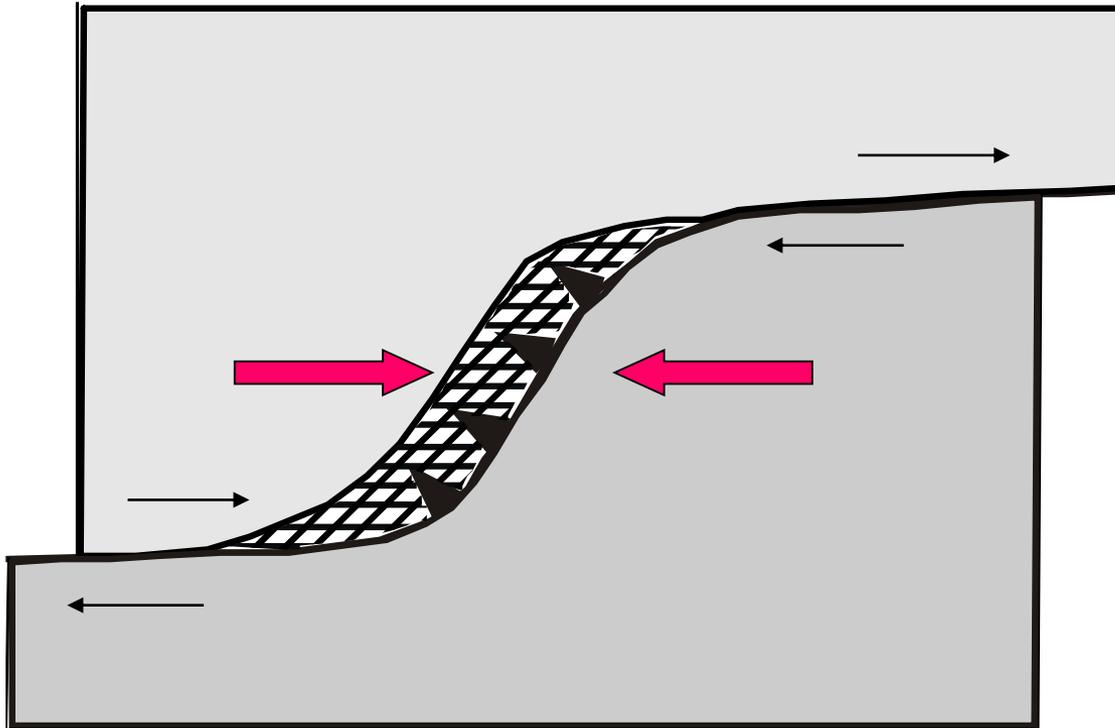
- Par glissement + écartement.



# FERMETURE

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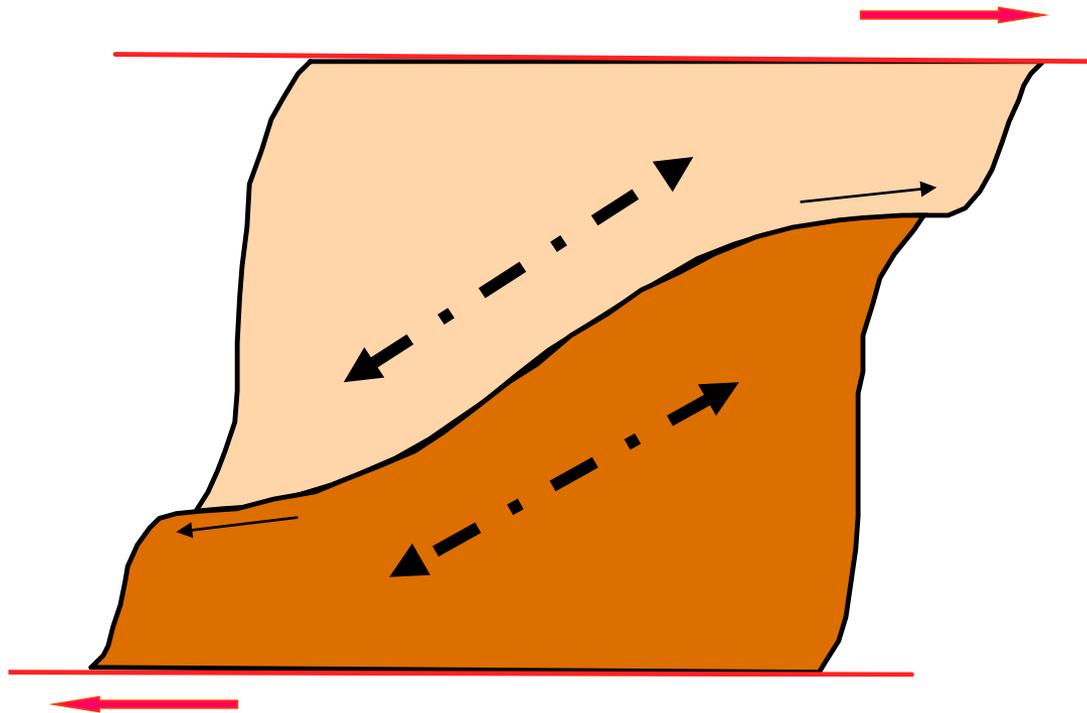
- Affrontement des blocs.



# FERMETURE.

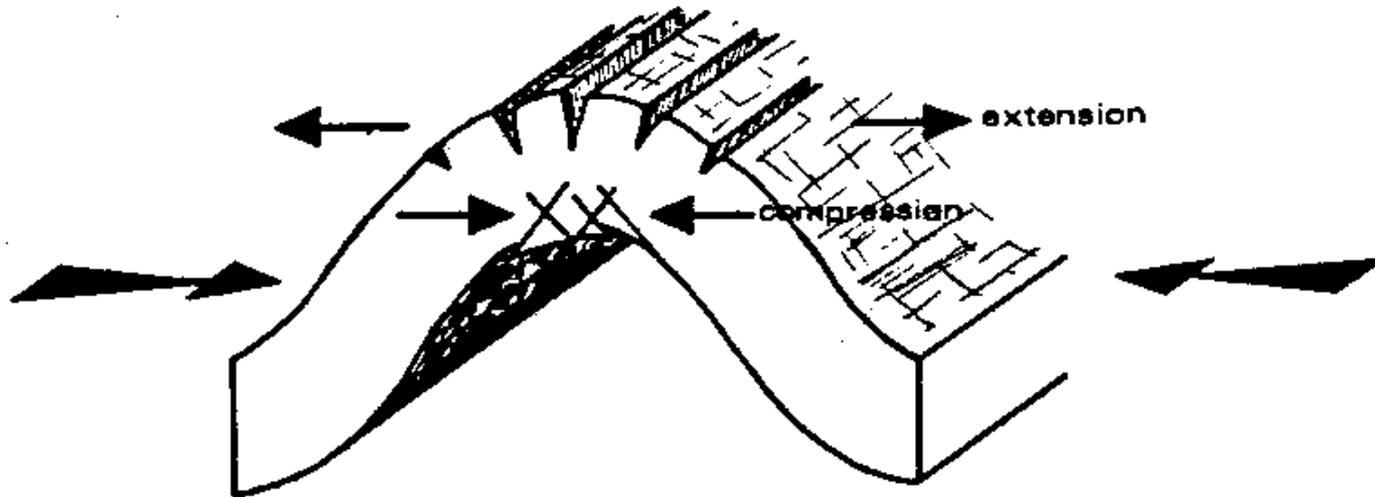
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- Affrontement de blocs souples.



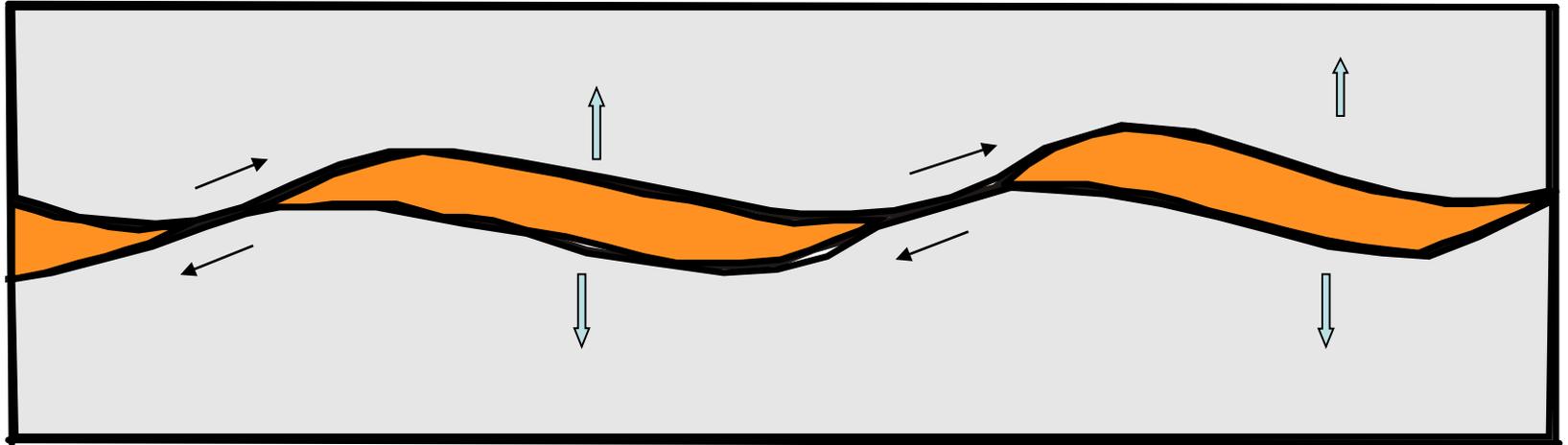
# FENTES EXTRADOS.

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# VENTRE ET NŒUDS

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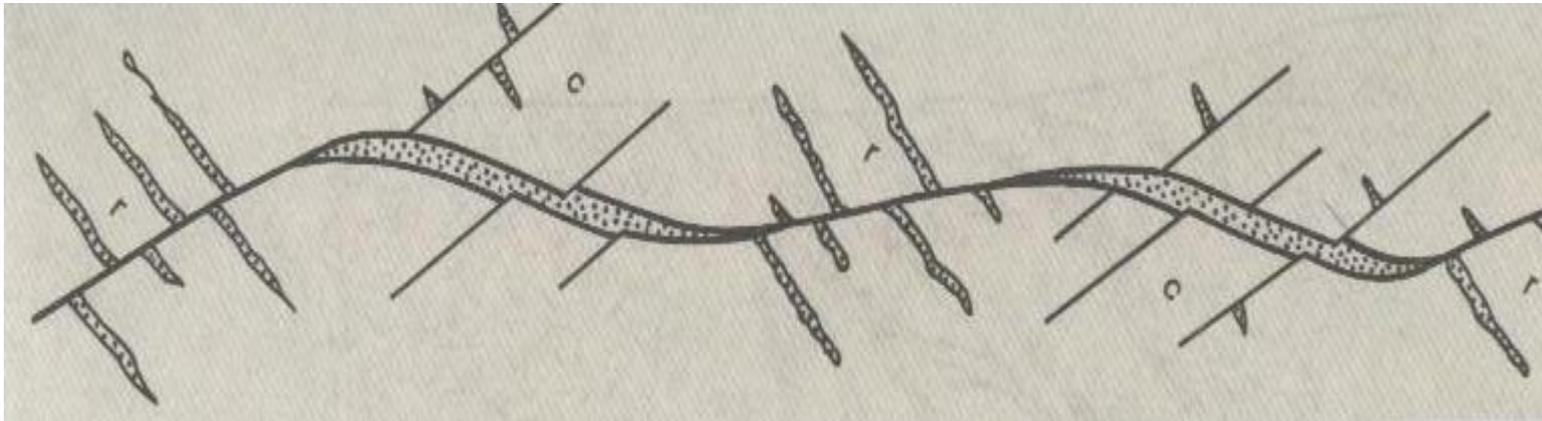
# FENTES (lentes)

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# CISAILLEMENT ARQUE

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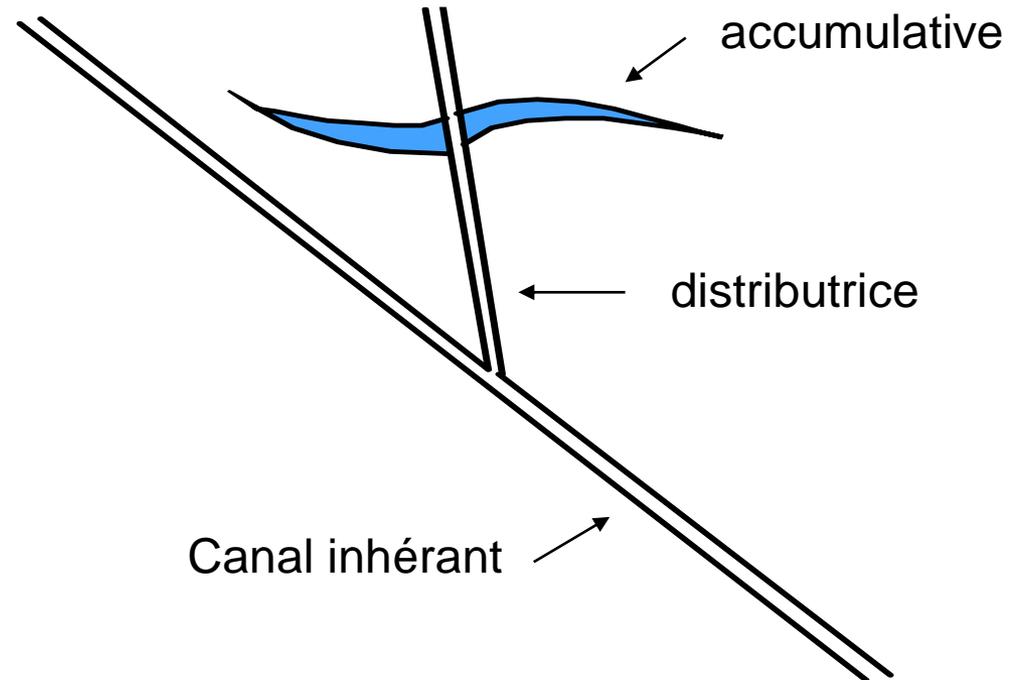


- Structure en ventres et nœuds
- Fentes d'ordre  $n$  et  $n+1$

# LES 3 TYPES DE STRUCTURES

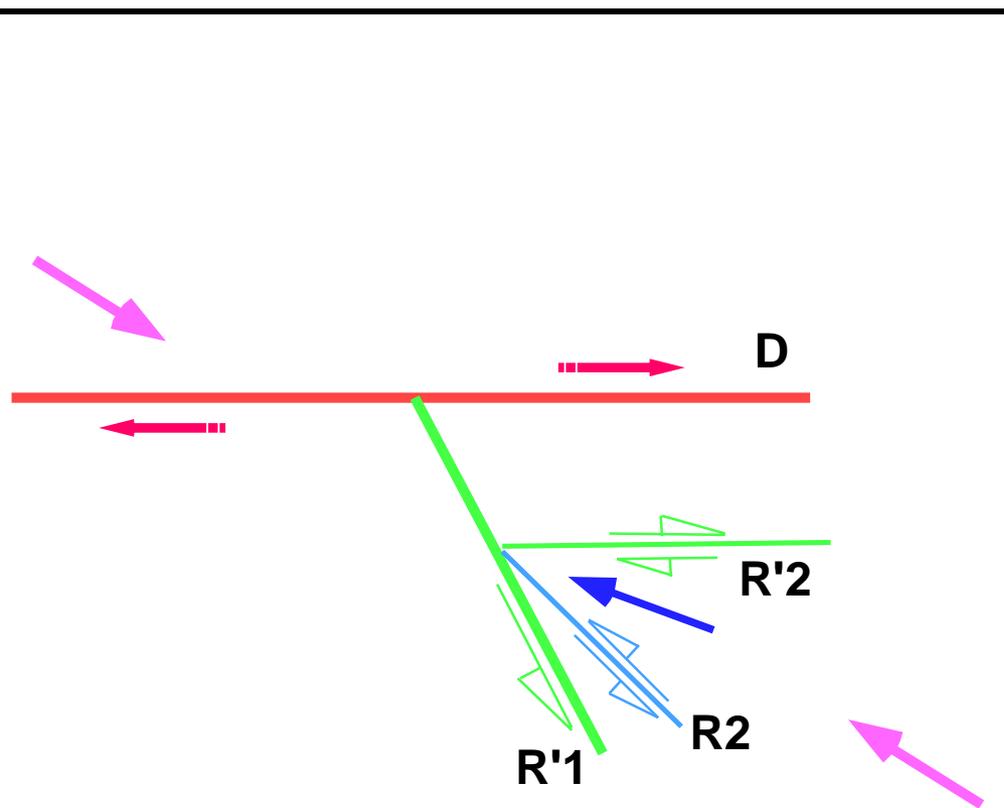
(selon SMIRNOV)

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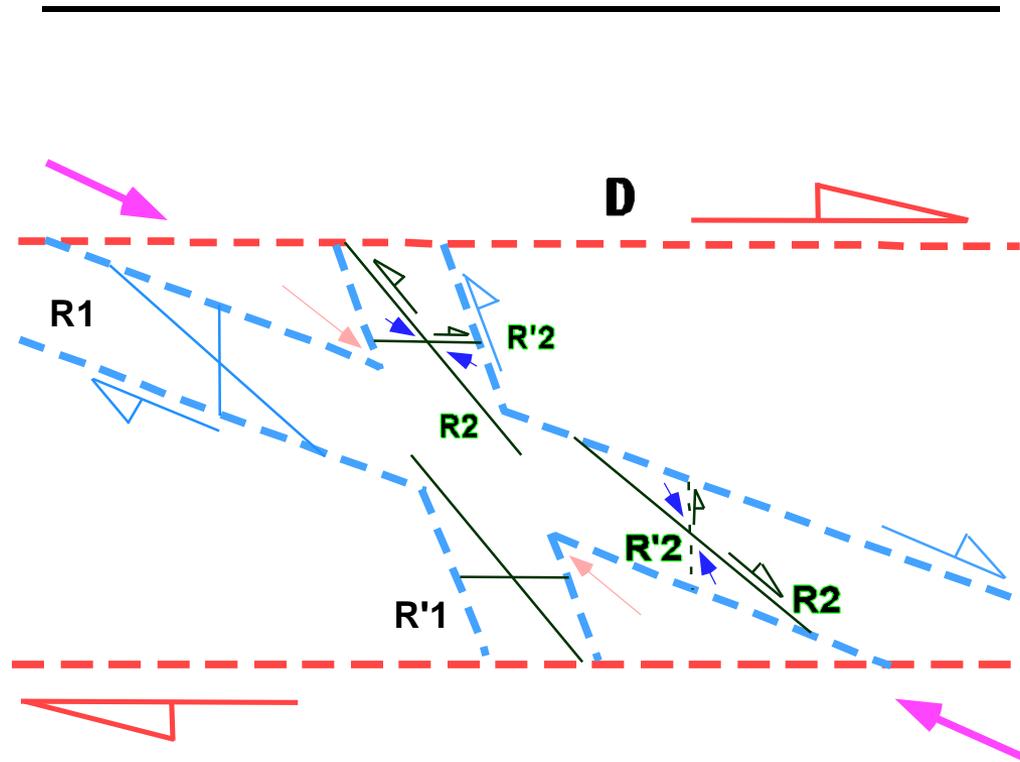


# Ordre des fractures

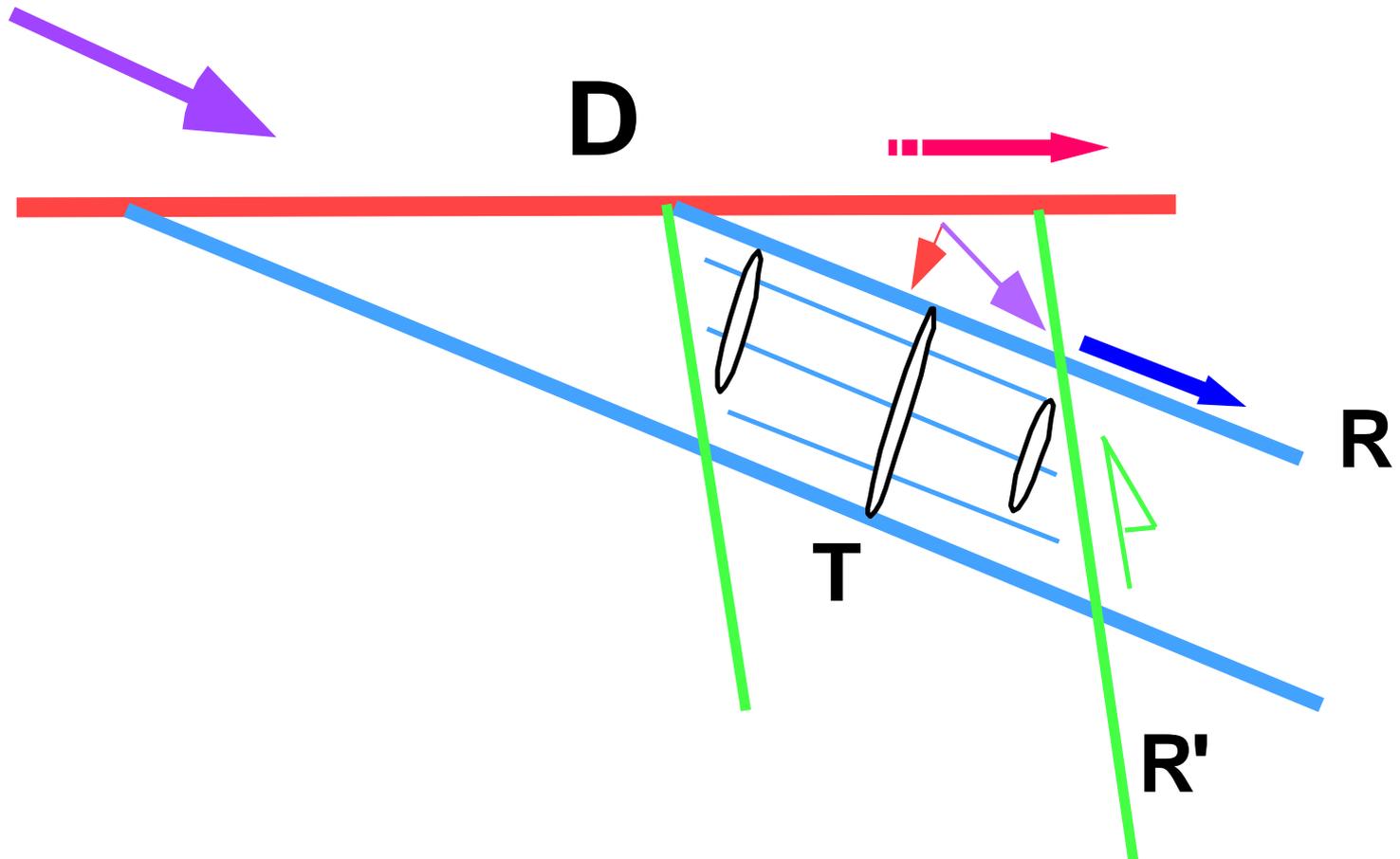
# Fractures d'ordre 2 sur une faille d'ordre 1 (type R')



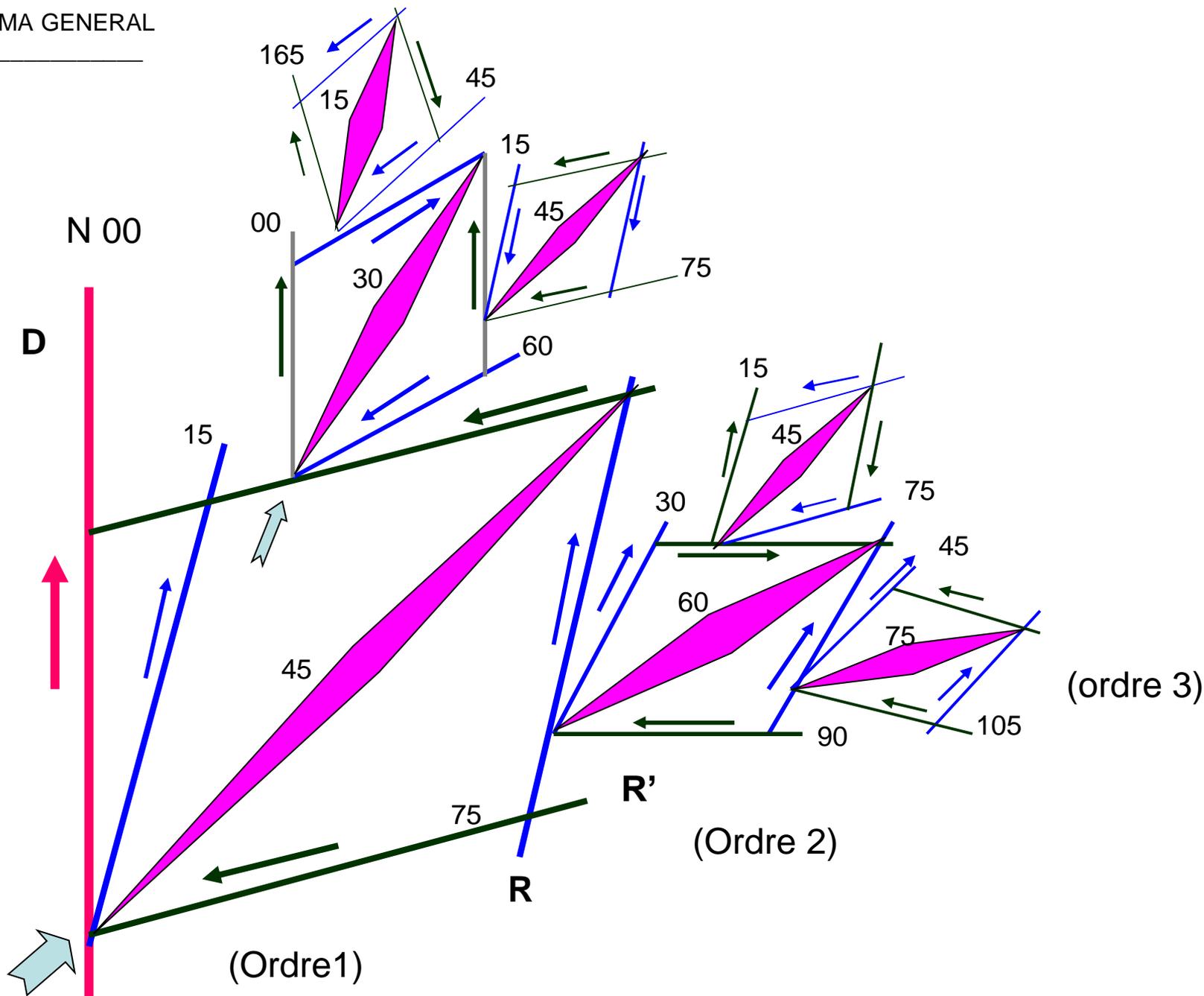
# Ordre des cisaillements élémentaires



# Fentes de tension d'ordre 2

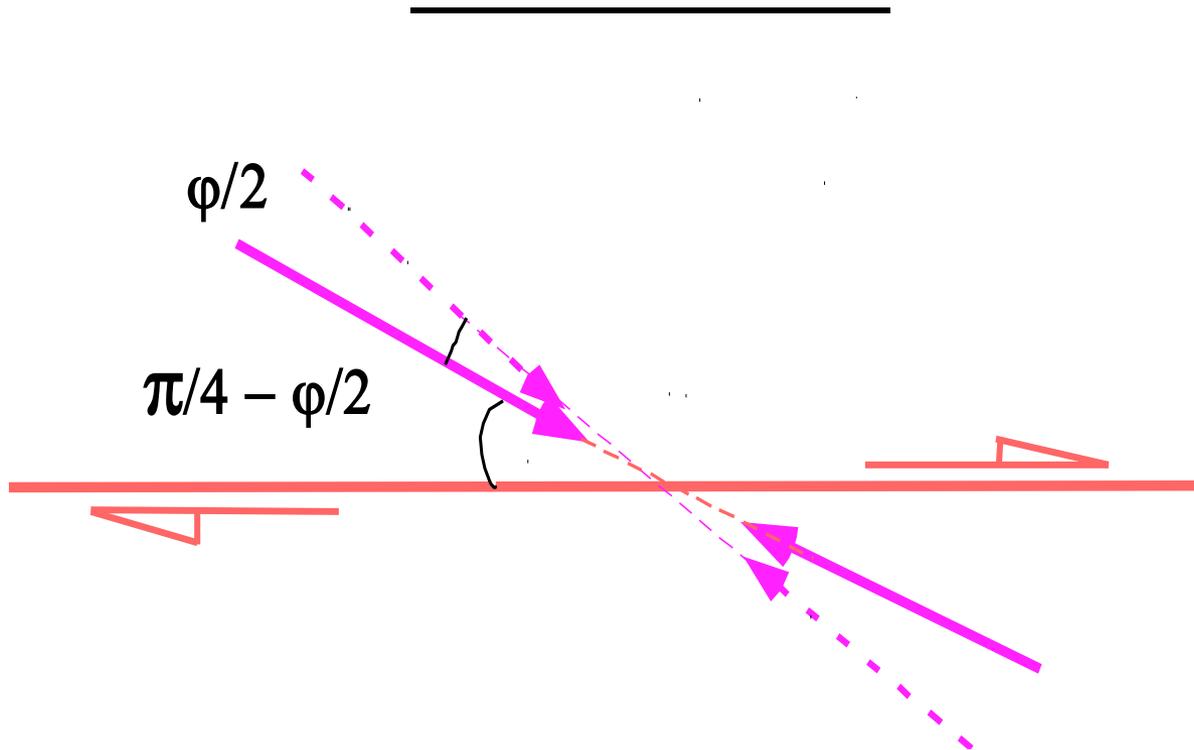


SCHEMA GENERAL

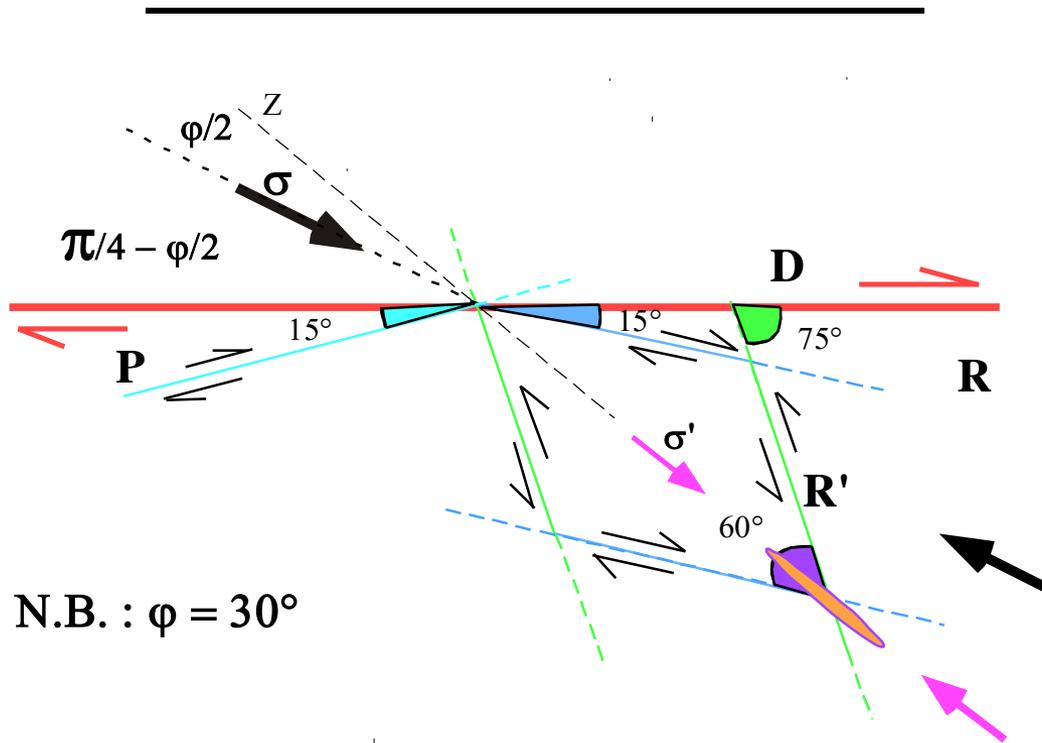


# RELATIONS ANGULAIRES

# Contrainte principale et Décrochement majeur

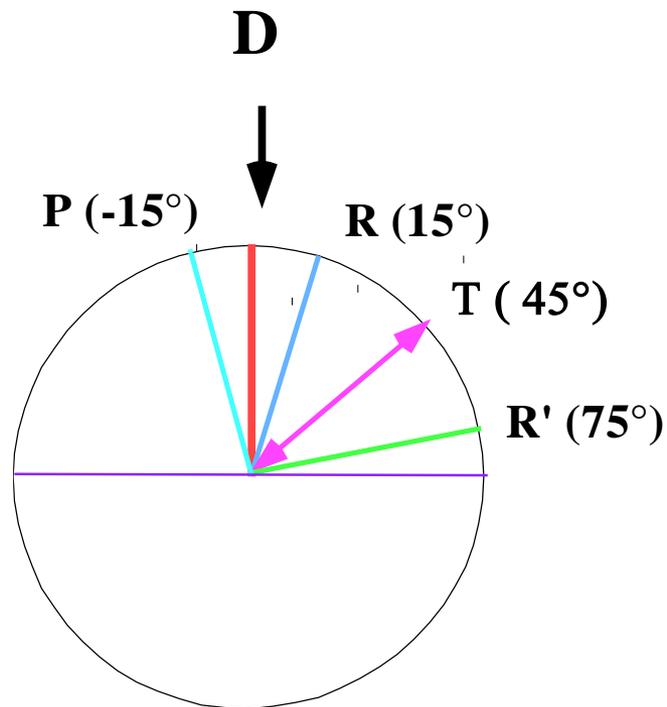


# Relations angulaires entre les différentes composantes



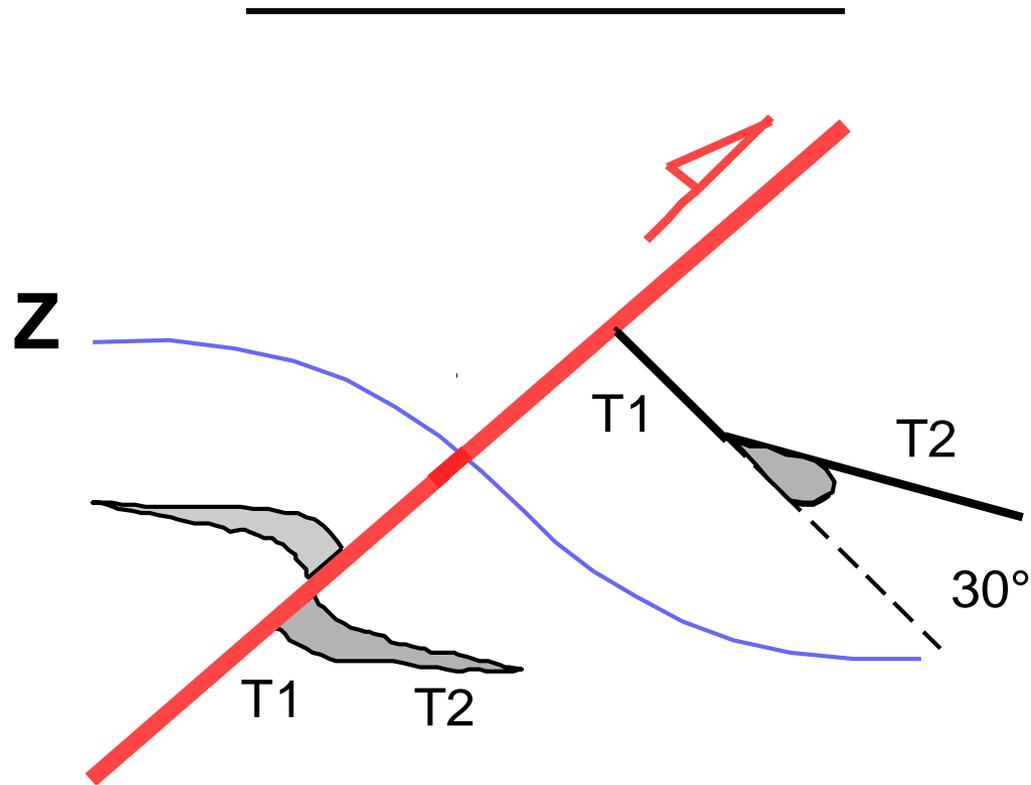
# Angles des composantes / D

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# Fentes de tension

## Changement de direction.



# Résumé : calcul des angles.

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		ANGLES AIGUS				
		$\sigma$	D	R	R'	P
A N G L E S O B T U E S	$\sigma$		$\frac{\pi}{4}$ (- $\varphi/2$ ) 30 - 45°	$\frac{\pi}{4} - \varphi$ 15°	$\frac{\pi}{4} - \varphi/2$ 30°	$\frac{\pi}{4} + \varphi/2$ 60°
	D	$\frac{3}{4} \pi +$ $\varphi/2$		$\varphi/2$ 15°	$\frac{\pi}{2} - \varphi/2$ 75°	$\varphi/2$ 15°
	R	$\frac{3}{4} \pi + \varphi$	$\pi - \varphi/2$		$\frac{\pi}{2} - \varphi$ 60°	$\Phi$ 30°
	R'	$\frac{3}{4} \pi +$ $\varphi/2$	$\frac{\pi}{2} + \varphi/2$	$\frac{\pi}{2} + \varphi$		$\frac{\pi}{2}$ 90°
	P	$\frac{3}{4} \pi - \varphi/2$	$\pi - \varphi/2$	$\pi - \varphi$	$\frac{\pi}{2}$	

$\varphi$  moyen = 30°