In extreme cases, particularly in presence of the basin adjacent to the fault which maximizes viscous relaxation, the fault may dip in opposite direction. At that moment, the pop up is abandoned in favor of a short cut fault.

Numerical experiments

Weak Basins

- Geometry: Factor 0 - Basin 10°
- Fault Strain intensity factor R = 10
- Local Foliation

Weak Faults

- Geometry: Factor 0 - Basin 10°
- Fault Strain intensity factor R = 10
- Local Foliation

Comments

Basins localize pop down structures in the basement noses of the fault, in response to the strong extension at the top of the upper crust.

Opportunistically, the rotation weakness of the basins affects only the middle of the extensional regime. It outlines that the folding is controlled by the viscosity of the basement.

In both cases, folding is predominant at depth but unexplained by the basins and sigmoidal surface folding.

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The interaction between faults and basins leads to more important deformational regime of the fault’s upper crust.

For nearly weak faults, the basin controls completely the deformation, whereas the distance between models B2 and B2F10 and the fault is not conserved.

The episodic shape being increased, we notice the same effect on a short cut fault at the front of the basin. This could also explain in which restoring mechanisms play on the fault would appear or not.

References


Basins & Faults

- Geometry: Factor 0 - Basin 10°
- Fault Strain intensity factor R = 10
- Local Foliation

Discussion

The fault is in motion as a brittle block. At depth, the fault is propogated into a fold.

In the area of the basin, the fault has a more ductile regime. At the surface, it continues to play in the brittle field. Within the BDT, it rotate counterclockwise in response to viscous drag.

The formation of the synclinal buckle is controlled by the basement and the boundary faults. The interaction between faults and basins leads to more important deformational regime of the fault’s upper crust.

The fault in the next model is located at the front of the basin. This could also explain in which restoring mechanisms play on the fault would appear or not.

Conclusions

The fault is a key element of importance of the different types of deformation in the basin. The fault controls the deformation in the basin, which affects the mode of deformation (B2 vs B5). This implies that the folding is controlled by the viscosity of the basement.

For very weak faults, the burial does not anihilate the effects of the fault. In the hanging wall of many of the basins, we observe an increase of basement folding.

Viscous faults are more plastic, and they continue to play in the brittle field. Within the BDT, it rotates counterclockwise in response to viscous drag.

The interaction between faults and basins leads to more important deformational regime of the fault’s upper crust.

Finer fault and synclinal buckle affects the structural evolution of the basins. The fault controls the deformation in the basin, which affects the mode of deformation (B2 vs B5). This implies that the folding is controlled by the viscosity of the basement.

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