Propagation of a thrust and associated damage in shales

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Résumé

Deformation in the roof and wall of a fault is generally metric to multi-metric. Here, we report the example of the Leyre reverse fault, where damage in the wall is on the order of hundreds of meters. This damage, recorded in Eocene marls, results in the successive appearance of pencil structures, then pencil cleavage, and finally, near the fault, slaty cleavage. A cross-section near the locality of Sigues allows us to monitor all the steps of this damage. Using the magnetic fabric of marl fragments, we can calculate a deformation in the range 0-80% assuming a rigid rotation of the clays (mainly illites). We propose a 2D map of this deformation in the fault wall. To explain the wide extent of the damage, the tri-shear model seems consistent with numerous observations, including the damage recorded, the gradient, the synclinal footwall, and evidence of pronounced shearing. This type of damage has been identified in other faults in the Jaca Basin.

Mots-Clés: thrust, cleavage, deformation, tri, shear

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