



## **Propagation of the deformation front beyond a décollement disrupted by a step : from the Jura case to general conclusions.**

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The North of the Jura fold-and-thrust-belt is an example of a thin-skin belt developed over a disrupted décollement. During Oligocene, the area of the current northern Jura undergoes the West European E-W extension that opens the Rhine and Bresse grabens, offsetting the Triassic evaporitic décollement layer. During Miocene, the alpine, roughly N-S, compressive regime folds this prefractured cover. The presence of deformation to the North of a step down in the décollement is sometimes interpreted as the proof of the activation of a deeper décollement, on the basis that outward propagation of deformation must activate shallower décollements and cannot activate deeper ones. Using the limit analysis theory, we demonstrate that for a given set of physical parameters (friction/cohesion), a lowered portion of a décollement can be reactivated depending on the height of the offset and on the topography above it. By sandbox experiment, we illustrate the general behavior of this localization along a disrupted décollement, we show that the offsets represent slowdowns in the deformation. They act as catching points that localize a ramp until the created topography is sufficient to block the ongoing deformation on this ramp allowing it propagation farther along the lowered portion of the décollement level. We use the mechanical analysis to quantify the general conditions in which an offset can block or not the propagation of deformation.