THE PERCHED PALEOSURFACES OF THE PYRENEES -CANTABRIAN BELT

Robert Wyns, Jessica Uzel

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WYNS, Robert[1], UZEL, Jessica[2]
A Source to Sink Total & BRGM collaboration
1: BRGM & ISTO, UMR 7327, BP 36009, 45060 Orléanscedex 2 (r.wyns@brgm.fr)
2: Géosciences Rennes, UMR 6118 – OSUR, 35042 Rennes cedex France

Perched paleosurfaces of the Central and Eastern Pyrenees have beenfirst described by geomorphologists for a long time (Birot, 1937; Lagasquie, 1982; Calvet, 1996) and more recently by geologists (Bosch et al., 2015; Monod et al., 2015; Bosch, in progress). These studies areof peculiar interestsince they provide robust constraints forthe timing and mechanisms of relief creation in a collision belt.

Pyrenean paleosurfaces have been recognized over large areas in the Axial Zone between the Aure valley to the West and the Cerdagne and Capcirgrabens to the East. The actual elevation of theses surfaces varies between 1000 and 2500 m above sea level. In Cerdagne, the graben filling has been dated ofVallesian age (Middle to Late Miocene). Based on thisconstraint,the entire Pyrenean perched paleosurfaceshave been considered of Miocene age.Since the palynofacies of the Vallesian sediments is interpreted as a near-sea level deposit, the present elevation of the paleosurfaces should have been acquired after the Vallesian assuming that all paleosurfaces have nearly a Miocene age. In the vicinity of Cerdagne and Capcirgrabens, the central Pyrenees paleosurface appears connected to the uppermost terraced paleosurface, suggesting an age prior to the Vallesian times.

A common feature of the Pyrenean paleosurfaces is the preservation of thick lateritic weathering profiles. In the Eastern Pyrenees, the paleosurfacesdisplay a terraced pattern with three or more levels, the highest being likely the oldest. In the Central Pyrenees (from the Aston Massif to the East to the Neouvielle Massif to the West), Thesinglepaleosurfaceis apparently offset along numerous faults. Field work will be conducted in order to collect structural data allowing a detailed tectonic evolution to be reconstructed.

In the Louron valley (close to the Aure valley), the central Pyrenean paleosurface is apparently downthrown along N160 trending faults facing the valley that define a graben-like feature with an overall NS trend. Field work will be conducted to check the structural relationships of such possible features with the reverse faults and thrusts linked to the Pyrenean compression.Preliminary investigations show that fault planes here bearshallow dippingslickenslides indicating a probable transtensional mechanism. A second set of normal faults trending N100 to N130, parallel to the belt, seems to offset the central Pyrenean paleosurface. These faults are observed in the Massif of Aston (SW of Ax les Thermes) where a detailed tectonic analysis will be conducted.

Paleosurfaceswill be followed from the Aure valley (central Pyrenees) to the East in order to decipher their origin and evolution: are they terraced surfaces or a single surface offsetalong recent faults having a general N160 and N100-130 orientation? Special attention will be payed to the occurrence of the preserved lateritic weathering profiles that allows reconstructing the lateralcorrelation of the paleosurface remnants. Finally, we plan to map thesepaleosurface remnants from the central Pyrenees to the Cantabric belt with a special attention to possible faults that might offset some portions.An attempt to date the weathering profiles using syn-weathering minerals (adulaires) will be conducted in the meantime. These data will collectively help better understanding the significance of paleosurfaces in collision belts.

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