



## **The Armorican Massif (Western France) - A buried relief two times exhumed in response to Iberia-Eurasia movements (Early Cretaceous, base of Cenozoic)**

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The Armorican Massif is an outcropping Variscan basement located in Western France. The age of its exhumation is debated, as most of the outcropping European basements: Is this relief a remnant of the planation of the Variscan Belt or a buried and then exhumed relief at time of the North-Atlantic (Biscay Bay) opening during Early Cretaceous or/and during the Africa-Eurasia convergence?

We performed a geomorphological study (based on DEM analysis and field controls) of the different landforms of the Armorican Massif. The dating of those relief forms is based on their geometrical relationships with the weatherings and dated preserved sediments. Our results allow to propose a model of evolution of the Armorican Massif and of its relief for the Mesozoic to Cenozoic period and underscore four main points:

- (1) The Armorican relief preserved old landforms – planation surfaces (mainly pediments and pediplains) – of Triassic (?) to Early Cretaceous age buried by Jurassic and Upper Cretaceous (chalk) carbonate platforms.
- (2) Those paleo-landforms were exhumed at two periods (i) Early Cretaceous in response to the opening of the Biscay Bay and (ii) Uppermost Cretaceous-Paleocene at time of the Iberia-Eurasia increasing of convergence.
- (3) A major planation surface – called the Armorican Surface – result from the Early Cretaceous physical and chemical (laterite) erosion when the Armorican Massif was the North rift shoulder of the Biscay Bay. This planation surface is later deformed (buckling?) and eroded during Uppermost Cretaceous and Paleocene.
- (4) During Paleogene times, a last generation of pediments is shaped and then flooded by the Mid-Miocene eustatic sea-level rise.
- (5) The Armorican relief and landforms is later incised by rivers, (i) during Upper Miocene to Pliocene and (ii) at the Early to Middle Pleistocene transition with the incision of the present-day valleys in both response to uplift (Apulia-Eurasia convergence) and climate (precipitation) change.