



A Pyrenean Cretaceous extensional fault system in the Briançonnais Domain of the Alps: implications for the eastern termination of the segmented Bay of Biscay-Pyrenean rift system.

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Recent studies in the foreland fold and thrust belt of the SW Alps reported that, in spite of the obliterating effect by the Alpine deformation, Mesozoic structures can still be recognised. These structures, occurring at the southern portion of the Western Alps arc, include a well-exposed crustal-scale Cretaceous extensional fault system. Field data (geological maps) and subsurface data (karst network) have been integrated to produce a detailed 3D reconstruction of this extensional fault system. Cretaceous faults affect the Paleozoic and Mesozoic successions and consist of a tens of km long E-W striking master fault, having in its northern block a set of E-dipping transverse extensional faults, having displacements in the order of hundreds of meters. The 3D reconstruction indicates that E-W extension, accommodated by transverse faults, is between 20% and 40%, and it reduces toward the E-W striking master fault. N-S extension is instead negligible and the E-W fault is interpreted as a Cretaceous right-lateral strike-slip fault. Removing the about 120° counter-clockwise vertical axis rotation, which is associated with the post-Cretaceous Alpine orogeny, the strike-slip fault becomes parallel to a suite of NNE-SSW to NE-SW striking faults occurring in the SW Alps foreland (present Provence region). We propose that, during the Cretaceous separation of Iberia from Eurasia, the NNE-SSW striking faults of Provence and Western Alps were delimiting to the east the Bay of Biscay - Pyrenean rift system. In detail, they formed a NNE-SSW striking transfer zone bounding to the east the Pyrenean arm of the rift, and likely ensured the connection of the Bay of Biscay - Pyrenean rift system with a further eastern, intra-plate, arm.