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The Variscan evolution of NW Africa : a re-evaluation

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NW Africa shows preserved remnants of the Variscan belt in Morocco and Algeria. They are part of the Late Paleozoic collisional system that is well-known on the North American counterpart and widely considered as the southwestern continuation of the European Variscan belt.
Nonetheless, this portion of the belt displays puzzling features. The Variscan belt in Morocco is in distal position with respect to the main belt that has been dissected by the Atlantic opening, e.g. no oceanic suture is found and it is hardly possible to localize the front of a major collisional belt there. The structural framework is well described but the Meseta in the north with S- and W-verging structures and displaying strong deformation evidences (Barrovian metamorphism) contrasts with the quite simple fold-and-thrust belt of the Anti-Atlas in the south with mainly SE vergent structures and no evidences of strong crustal deformations. The differences of orientation, intensity of deformations and magmatic activity imply strong strike-slip displacements along the South Meseta Fault Zone that may have juxtaposed two different domains during the Variscan orogeny. Anyway, the pre-Variscan paleogeography of the area is still poorly constrained.
In this contribution, we reconsidered the structural, metamorphic and magmatic features in order to propose a new interpretation of the Variscan belt in NW Africa. We emphasize the fact that Morocco and Algeria were deeply affected by Late Devonian-Early Carboniferous very hot rifting events. This previous inherited structural and thermal framework had a crucial impact on the subsequent evolution of the Variscan domain in NW Africa. In the light of our new observations and data and the critical evaluation of the available literature about NW African Variscan and other modern and ancient belts, we propose a new model to explain the peculiar features of the Variscan belt in NW Africa and discuss its integration in the Variscan world.