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Ordovician fragmentation of Gondwana: Integrated magmatic – sedimentary – structural record of the Variscan domain

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Fragmentation of northwestern Gondwana took place in a context of massive and widespread magmatism during the Ordovician. With the improvement of U-Pb dating techniques, Ordovician plutonic and volcanic rocks have been increasingly documented throughout the Variscan orogen of Europe. The origin of this magmatism is largely debated if not largely conjectural. But it implies a lithospheric and most probably asthenospheric reorganization of the northwestern fringe of the Gondwana continent, which impacted on the record of later convergence between Gondwana and Laurussia as well as on Variscan collision processes. The Ordovician sedimentary record, and particularly that of the “Sardic” unconformity also poses the issue of the potential links between external and internal geodynamics via lithospheric deformation during the Ordovician crisis.

The Ordovician crisis is richly documented throughout the Variscan belt, but mainly at numerous localities and mostly from a monodisciplinary perspective, notwithstanding the fact that the structural environment of Ordovician sediments, plutons and volcanics has rarely been investigated. Our project (ORDISCO) aims at evaluating the coupling between internal geodynamics, crustal deformation and the sedimentary record during dynamic reorganization of the Gondwana margin later involved in the Variscan collision. It involves the implementation of a harmonized geodatabase gathering the magmatic, structural, sedimentologic, stratigraphic, and geochronological information on the Ordovician period at the scale of the Variscan belt of Europe. The project also includes the detailed multidisciplinary study of three key regions of the inner part of the Gondwana margin located in Southern France and Spain and the reexamination of the reference sites in Sardinia.

The present contribution aims at presenting the geodatabase and the progress made at building the magmatic / geochronological sub-base, as well as the first stratigraphic, geochronological and structural results from the Variscan foreland in Southern France.

