



Pre-Mesozoic basement of the SW Paris Basin (France): The structural pattern of the Stephano-permian basins revisited using combined seismic, aeromagnetic and gravimetric methods

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Stephano-permian basins are found in several rather small places in and around the present-day French Variscan basement. They are mostly considered as intramontane post-orogenic (Variscan) basins, developing in close relationships with crustal to lithospheric geological events (such as extensive strike-slip, exhumation of metamorphic rocks, and widespread magmatism).

On the other hand, little is known about their occurrences under their post depositional sedimentary covers. This is for instance the case in the Paris Basin, where significant but scarce studies aimed to find their location under the Mesozoic sedimentary cover. There, the questions of their extension, thickness, sedimentary filling, internal geometry and structural control still remain open. In the same way, their differential conservation compared with the basins known in the field, or the possible structural decoupling between the pre-Mesozoic and Mesozoic units, has still to be debated.

Our study addresses the Stephano-permian basins located in the south-western part of the Paris Basin. We use combined subsurface tools, such as boreholes, newly reprocessed seismic lines (about 1400 km length), recent high-resolution aeromagnetic surveys, and ground gravimetry data.

Our main observations and results can be summarized as follow: (1) the Stephano-permian sedimentary sequences can reach thicknesses up to 2800 m; (2) the primary Stephano-permian structural signal is strongly disturbed by post Permian tectonic activity (polyphase and late strike-slip faults); the latter has therefore to be removed to get the former; (3) the sedimentation took place under 2 successive phases, with a clear structural control at the initiation of the basin, preceding a more diffuse subsidence pattern; (4) the map view of the structural pattern and the cartographic extension of the basins shows the predominant role of strike-slip structures during the sedimentation processes.