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The response of the French sedimentary basins to the Pyrenean and Alpine compressive phases: insights from the reprocessing and interpretation of regional seismic lines

Laurent BECCALETTO¹, Olivier SERRANO¹, Renaud COUEFFE¹, Laure CAPAR¹, Stéphane MARC¹

¹BRGM-French Geological Survey, Geology Division, Orléans, France, Email l.beccaletto@brgm.fr

The French Geological Survey (BRGM) has recently launched the regional structural seismic study of the 4 major French sedimentary basins (Paris Basin, Aquitaine basin, South-East basins, and Upper Rhine Graben).

69 regional transects, representing a total of about 7,100 km length, have been reprocessed and interpreted. The transects are made of hundreds seismic profiles recorded by the petroleum operators between the 60' and the 90'. Our paper specifically aim (1) to introduce the methodology used by the BRGM in the building and reprocessing of these regional seismic lines, and (2) to present the first results given by their interpretation.

We put the emphasis on the structural frame of the various basins, with a focus on their responses to the Late Cretaceous-to-Eocene Pyrenean and Miocene Alpine compressive phases. The decollement role of the salt diapirs is highlighted in the Aquitaine Basin. In the Paris Basin, the deformation is characterized by the occurrence of short-wavelength folds and asymmetrical anticlines, generally related to the reverse reactivation of previous normal faults. The South-East basins are characterized by low-angle thrusts rooted in the saliferous Triassic levels. As for the Upper Rhine Graben, it exemplifies the relationships between the Alpine Jura thrusts and the strike-slip structures related to the regional Eo-Oligocene rifting phase. We finally confirm the widespread genetic links between inherited (e.g. late Variscan) and late Cretaceous to Cenozoic tectonic structures.