

Retrodeforming the Sivas Basin (Turkey): Structural style of the central Anatolian basins and their integration in the geodynamic framework of Eastern Anatolia

Etienne Legeay (1,2), Jean-Claude Ringenbach (2), Jean-Paul Callot (1), Geoffroy Mohn (3), and Kaan Kavak (4)
(1) LFCR UMR 5150, Université de Pau et Pays de l'Adour, PAU, France (etienne.legeay@univ-pau.fr), (2) Structural Geology Department, Total SA, CSTJF, PAU, France, (3) Géosciences Environnement Cergy, Université de Cergy-Pontoise, CERGY-PONTOISE, France, (4) Department of Geological Engineering, Cumhuriyet University, SIVAS, Turkey

Anatolia is the result of the amalgamation of Gondwanian microcontinents against Eurasia active margin. These were originally separated by several Neotethyan oceanic domains consumed by north-dipping subductions. Prior to the continental collision, regional convergence resulted in an obduction event, from north to south in Campanian time, which led to the emplacement of ophiolite nappes and ophiolitic mélanges onto the Tauride passive margin. Several sedimentary basins subsequently developed above the former sutures zones recorded the long-lasting geological evolution of the Anatolian domain from Late Cretaceous to Present. The Sivas Basin is all together the richest, the most studied and also most complex of the group of Tertiary basins.

The Sivas Basin formed above the northern leading edge of the Tauride platform, the Kırşehir micro-continent, the edge of the Pontide arc and the related sutures. Its complex structure is that of a fold-and-thrust belt with syn-orogenic salt tectonics. After the obduction, the Sivas basin recorded a relative quiet tectonic phase from Maastrichtian to Paleocene with basinal pelagic sedimentation and carbonate platform emplacement on its southern edge. Then shortening resumed in the Early Eocene with the development of north-verging thrusts. It is recorded by a coarse clastic input, with conglomeratic deltas fans grading up to basinal turbidites until the Late Eocene. Then the basin is progressively isolated and becomes an isolated foreland in which a thick evaporite formation deposited. Oligocene to Miocene continental clastics deposition was then mainly controlled by halokinesis: minibasin, salt ridges and salt sheets development. A first canopy is attributed to the second pulse of contraction from Late-Oligocene to Middle Miocene. This second stage end with the formation of back-thrust within the Sivas Basin and southward as a passive roof above a pre-salt triangle zone.

This study relies both on extensive fieldwork (4 PhDs) and the interpretation of 2D seismic lines, courtesy of TransAtlantic Petroleum. A set of dip and strike cross-sections and an evolution model will be shown and illustrated by field views. The now well-constrained evolution at the scale of Sivas Basin will be compared to the sedimentary record of the other Central Anatolia basins (Ulukışla, Darende and Ekhiman) and their structural evolution.