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Detailed Fracture Studies of a Fault-Propagation Fold in the Spanish Pyrenees Fold-and-Thrust Belt

A fracture study was undertaken in the San Corneli anticline of the Spanish Pyrenees in order to decipher the genetic relationship between folding, faulting and fracture development. A deeper understanding of the mechanical significance of fractures and their development is required to make predictions as to the distribution of fractures in subsurface reservoirs. The fracture study was conducted mostly in Upper Cretaceous limestones and calcarenites, interpreted as transitional shelf-edge facies and lithologically similar to the Centenera sandstones, a productive fractured reservoir unit.

Detailed field surveys of outcrop scale fractures on selected exposures and photogrammetry studies of cliff face scale fractures were used to characterize the fracture pattern within the San Cornelli anticline. The anticline is a S-verging, W-plunging fault-propagation fold that formed above the Bóixol thrust fault in the Central Pyrenees. It extends for more than 35 km towards the east, where its axial trend swings slightly to the NE. In the study area, the San Corneli anticline measures 3 km across and is characterized by a steeply-dipping to vertical south limb and a gently-dipping north limb.

The field example will be used to predict fracture distribution and build a 3D fracture model in conjunction with a 3D structural model. The modeling methodology will then be applied to subsurface examples in order to predict fracture distribution at depth in reservoir units in similar fault-propagation fold geometries.