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P. Giampaoli¹, M. A. Gait¹, F. Dzelalija¹ (1) Repsol-YPF, Buenos Aires, Argentina

Structural Analysis of the Cerro Fortunoso Block, Neuquen Basin, Argentina: Results and Applications on Exploration and Development Projects

This study illustrates how new structural interpretations in mature oil provinces may lead to the elaboration of models that improve the development of oil remaining reserves as well as the discovering of new oil bearing structures. This is particularly true in most fold and thrust belts characterized by complex structures and/or the scarcity and bad quality of the available well and seismic data. The example described comes from the Cerro Fortunoso oil province, located at the Malargüe Fold and Thrust Belt, Neuquén Basin, Argentina. The methodology applied involves the analysis of both surface and subsurface geological data, the identification of the main structures, the elaboration of a detailed geometric analysis of the oil field structure and the application of forward modelling techniques. The structures located in the area have a NNE-SSO orientation and are probably related to the Neogene's inversion of the Ranquil có-Del Petiso half-graben. The Cerro Fortunoso anticline is an asymmetric, west verging structure affected by different kinds of faults. The forward modelling of the anticline allows the identification of three deformational stages involving both thin and thick-skinned tectonics. The shortening varies along strike and has a mean value of 955 m (22%). From an exploration point of view, the structural model allowed the recognition and discovering of a prospect located on the vicinity of the oil field. From a production point of view, this study has made possible the identification and extraction of previously no developed oil reserves.