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LE BEC Arnaud¹, van BUCHEM Frans² (1) IFP, Bordeaux³ University, Rueil Malmaison, France (2) Institut Francais du Petrole, Rueil Malmaison

Lower Cretaceous carbonate platform and basin evolution of the SE Arabian Plate : Sequence stratigraphy and stratigraphic forward modeling

The Rayda Basin, located in northern Oman at the south-eastern passive margin of the Arabian plate, has been filled by a carbonate system that prograded over 300 km during the Lower Cretaceous (Berrisian-Barremian). Based on subsurface and outcrops data the geometries, facies and geochemistry of this system have been studied. Stratigraphic forward modeling (DIONISOS) is used to test the proposed depositional model. The outcrop consist of on nine measured sections, completed, thin section and geochemical analysis. The subsurface dataset includes regional seismic lines, core material and wireline logs. The seismic shows two types of clinoforms. Correlation with the outcrops suggest that the high angle system is dominated by high-energy, grainy facies, while the low angle system is dominated by a low-energy, carbonate mud facies. These overall geometries probably define the large scale sequence organisation. The combination of seismic all controlled geometries and sub-seismic scale outcrop observation allow to propose depositional models, including sedimentation processes, geometries and facies. This information is used to constrain the 3D stratigraphic forward modelling of this system.