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3D NUMERICAL RECONSTRUCTION OF AN OLIGOCENE CARBONATE RAMP. IMPLICATIONS FOR HC RESERVOIRS FROM THE CARIBBEAN AND SE ASIA

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ABSTRACT: Numerical modeling arises as a state of the art technical innovation to simulate natural processes reproducing their controlling conditions. Extensive field research has provided valuable information for reconstruction of paleo-environments whose geological records represents the result of many processes developing and interacting between each other during ancient times. On this context, different combinations of controlling conditions can be used to run several computational simulations, creating numerical models that mimic characteristics of real examples and getting insights about the processes that lead to comparable results. Such insights, can be considered as valid and useful to analyze, understand and predict characteristics of contemporary analogues. SIMSAFADIM-CLASTIC, a process-based forward numerical geological modeling software developed in the GEOMODELS Research Institute at the University of Barcelona, had been used to recreate the conditions that controlled the deposition of Oligo-Miocene sediments in the homoclinal carbonate ramp identified at the Rebaladí-Benitatxell area, located in the south-east Spain. Simulations considered control due to carbonate production, sea-level variations and clastic sediment input. Despite simplifications carried-out during modeling, results display a good correlation to the real example in terms of depositional profile and facies distribution. Implications that, procedure and results of simulations could have to improve the knowledge about the contemporaneous Perla Gas Field in the Caribbean (northern Venezuela) and the Tonasa Limestone (Indonesia), are explained as applications of numerical modeling to develop production on gas fields and, to identify potential petroleum systems.