

Fast Flowpath Constrained-Simulating of J_Mz+R (!)

Petroleum System, Tuha Basin

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ABSTRACT

Tuha basin is an old exploration area in the west of China, in which it has been more and more difficult to find new targets in folded belts. In order to discover new exploration prospects, fast flowpath constrained-simulating (FFCS) was applied to J_Mz+R (!) system, Tuha basin.

FFCS in Tuha basin included: (1) Fault conduits analyzing: FFCS was applied to decide the position and effect of fault conduits for migration. It was proven first that the tear faults between adjacent thrust folds were important vertical conduits. (2) Modeling equivalently: The system was divided equivalently into 5 carrier beds and 215 drainages. (3) Constrain conditions analyzing: Based on sensitivity analysis, the simulation was constrained by the known petroleum distributions (oil reservoirs, dry wells, and oil seepages), charge history, oil-to-source correlation, as well as the filling rate and gas-oil ratio of reservoirs. (4) Repeated simulating: FFCS was used to simulate the migration process of the system model again and again, until the petroleum pattern and parameters simulated met most constrain conditions.

As the results: (1) Four play types, which composed with subtle traps, were discovered in three belts, the north and south slope of Huoyanshan-Qiketai thrust belt, and the footwall of Bogeda folded mountain. All of them would provide about 64% of the potential resource of the system. (2) The leak-off volume from Huoyanshan-Qiketai thrust fault was about 1.68 billion barrels. (3) Based on the simulated hydrocarbon distribution, volume, and flowpath pattern, 9 exploration prospects were generated and evaluated fast.