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Characteristics of fault system in Enping sag

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In order to identify the characteristics of fault system and its control on hydrocarbons, the analysis of geometrical characteristics and kinematic processes were carried out.

Using abundant seismic and log data, we characterized and divided the types of fault system; compared the characteristics of fault system in different layers, and built the structural mode of basin. Taking into account fault activity rate, profile of equilibrium recovery and extension rate, the basin structure in every tectonic evolution stage is interpreted. The hydrocarbon migration simulation experiment revealed the control of fault system on hydrocarbons.

The results show that Enping sag mainly developed three fault systems, NE, NW and EW-trending faults. The faults can be subdivided into tensional and slip-tensional types. Each period of fault active intensity is different. There are three periods of fault activity in the sag. During the period from Eocene to Early Oligocene, regional stress field clockwise transformed from NW-trending into NS-trending tensional stress during rotating extrusion of the Indochina block and subduction of the proto-South China Sea. This resulted in the change of basin controlling faults from NNE, NE-NEE-trending into EW, NWW-trending. During the period from Late Oligocene to Middle Miocene, the sag was in the stage of post-rifting subsidence and faulting movement was small, NW-trending faults went successively in action. In Late Miocene, NE-trending dextral strike slipping, which resulted from arc-continent collision, reactivates NWW and subparallel EW pre-existing faults and formed additional strike slip faults. The relationship of faults between early- and late-stage suggest that the faults could be classified into 4 types: long term active, terminal activity, inherit-reworked and newly developed faults. It has been found that the long term active and inherit-reworked faults are the main hydrocarbon migration paths. In Enping sag, zones with long term active faults and uplifts in sag are the most favourable area for hydrocarbon accumulation.

