

Structural Characteristics and Evolution of the Sufyan Depression, Muglad Basin in Sudan

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ABSTRACT

By identifying the structural patterns on seismic profile and restoring the tectonic evolution history of the major profile, the structural characteristics and evolution of Sufyan Depression, Muglad basin, has been studied. The results show that, the Sufyan Depression is a graben that is steep in the south and gentle in the north as a whole, and the tectonic framework presents “west-east differentiation and north-south dissimilitude”. Normal faults can be classified into two major categories and five types, of which the basement-involved listric normal fault and sedimentary cover-rotary plain normal fault are the main type. As the tectonic evolution of Central Africa Shear Zone and the periphery plates progressed, the Sufyan Depression experienced three stages of fault-depression evolution: the first stage in the Early Cretaceous Barremian to Late Cretaceous Turonian is very intense, the second in the end of Late Cretaceous to Paleocene and the third in the Neogene until Present are quite weak. In addition, during the depositional stage of the fourth and fifth member of the Abu Gabra Formation, which is also the early period of the first evolution stage, the depocenter is located in the central and southern Sufyan Depression; during the last two stages, however, the depocenter is located in the subsag which is adjacent to the southern boundary fault. Thus, it is predicted that the central sag will be favorable exploration area of the fourth member of the Abu Gabra Formation (the deep strata).