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Backstripping analysis of the Kachi-1 well in the Gunsan Basin in Yellow Sea, offshore Korea

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The Gunsan Basin that lies on the Yellow Sea in east Asia is a Mesozoic-Cenozoic sedimentary basin, which has 5 exploration wells. For backstripping to analyze the detailed tectonic evolution of this basin, this study is based on the Kachi-1 well drilled in anticline structure of the SW sub-basin, because the Mesozoic strata of this well require re-arrange on structural development and rifting process of the Gunsan Basin. The procedure for backstripping a sedimentary basin starts with the stratigraphic division, and requires porosity, porosity-depth coefficient, paleobathymetry and sea-level change. The Stratigraphy of the Kachi-1 well is studied mainly 5 sequences ; I) Late Jurassic – Early Cretaceous, II) Early Cretaceous, III) Late Cretaceous (Cenomanian – Early Maastrichtian), IV) Late Cretaceous (Late Maastrichtian), V) Middle Miocene – Present. Lithology type of sequence I – IV is predominated by claystone and siltstone with thin sandstone, deposited in nonmarine environment. And, sequence V is predominated by unconsolidated sandstone deposited in shallow marine environment. Porosity-depth plot analyzed from neutron log data of the Kachi-1 well have characteristic exponential trend. From the trend line, this study estimated the predicted Po (initial porosity) and c (decompaction coefficient) of the Gunsan Basin. Backstripped from these data, subsidence history of the Gunsan Basin has quite consistent subsidence trend from Late Jurrasic to Late Maastrichtian. It consists relatively of high subsidence period (sequence I and IV) and low subsidence period (sequence II and III). After uplift and erosion period of Paleogene, this basin started to subside again.