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**Application of High-Resolution Sequence Stratigraphy in Rift Lacustrine Basin –  
A Case Study of Shahejie Formation, Paleogene, Gaoliu Area, Northeast Bohai  
Bay Basin, China**

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With the progressing petroleum exploration in rift lacustrine basin, the traditional scheme of sequence stratigraphy is not applicable for the delicate phase of exploration. Besides, crucial parameters, such as the boundary fault activities, the sedimentary source and the paleoclimate, control the development of stratigraphy in rift lacustrine basin, which leads to the regular and rapid changes of the short term base-level cycle, the accommodation space and the strata stacking patterns. Therefore, a question that petroleum geologists face is how to effectively use high-resolution sequence stratigraphy theory to predict stratigraphic and lithologic reservoirs in rift lacustrine basin. The high-resolution sequence stratigraphy focuses on the scales of observation that typically fall below the resolution of seismic data, commonly referred to as of 4th-order or lower rank. Therefore, logging curve pattern and core-based analyses are significant for recognizing characteristics of these scales and provide the basis for the high-resolution sequence stratigraphy. This paper presents a case study of Shahejie formation, Gaoliu area, Northeast Bohai Bay Basin, where the crucial parameters are involved. Based on the seismic data, wells, log and cores, the features of every 4th-order sequence were recognized, and the isochronal sequence stratigraphic framework for the Shahejie formation was built. Then, the corresponding relationship among the lithologic facies, logging facies, and seismic facies of Shahejie formation were established through cores observation, well-seismic calibration and geological-geophysical modeling. Furthermore, the spatial and temporal distribution of microfacies and sedimentary source were carried out by means of logging analysis and seismic attribute extraction. Besides, combined with the tectonic evolution stages and the distribution of microfacies, the high-quality sandbodies were predicted. The results show that twelve 4th-order sequences are recognized, ten kinds of microfacies are figured out and six types of trap are predicted. This paper also gives an example about the use of high-resolution sequence stratigraphy in rift lacustrine basin.

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