

论文

济阳拗陷车镇凹陷沙河街组旋回地层学研究

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摘要:

选定车镇凹陷沙河街组车古29等7口井测井资料依次从西南向东北方向进行旋回地层学研究。借助Matlab软件平台及其小波变换工具箱, 基于前期建立的米氏周期识别方法——米氏周期最佳匹配分析方法, 对7口井测井资料中识别出来的周期进行剔除和选择, 进而确定地层中记录的优势米氏周期。通过沉积速率计算及沉积厚度变化的分析, 揭示了该区地层中米氏旋回发育规律及三角洲、湖盆发育特征, 标定了不同层段年龄。研究发现: 车镇凹陷沙河街组地层中广泛发育米氏旋回层, 高频信息比较多; 该区三角洲、湖盆从西南向东北大体上呈推进(扩张)——萎缩——推进(扩张)的差异性; 周期比较长的米氏旋回(偏心率长周期)易于在沉积速率小的层段保存, 周期比较短的米氏旋回(岁差、黄赤交角)易于在沉积速率大的层段保存; 根据计算结果, 推断车镇凹陷沙一段顶界年龄在31.5~32.5 Ma, 沙二段顶界年龄在32.7~33.2 Ma, 其中车古29、车35、车古203、大古63井的沙一段顶界年龄分别为32.4, 32.4, 32.1, 32.5 Ma。

关键词: 车镇凹陷; 沙河街组; 米兰科维奇旋回; 小波变换; 沉积速率

Study on cyclostratigraphy of Shahejie Formation in Chezhen Sag, Jiyang Depression

Abstract:

Chegu29 wells which distributed from southwest to northeast were selected for the study of Milankovitch cycle. With the help of Matlab software and Wavelet transform toolbox and on the basis of the previously constructed recognition method of Milankovitch cycle, cycles identified from logging data of seven wells were selected and then the dominant Milankovitch cycles recorded in strata were determined. The development regularity of Milankovitch cycle and the development characteristic of delta and basin were revealed, the age of strata was calibrated by the analysis of sedimentary rate and depositional thickness. It is found that Milankovitch cycles are widely developed in Chezhen Sag. The development of the low-frequency informations is inferior to the high-frequency ones. The delta and basin exhibit difference of expansion-shrinking-expansion from southwest to northeast, the relatively low-frequency cycles(Eccentricity) are prone to be preserved in the stratum whose sedimentary rate is lower, the high-frequency ones(Precession, Obliquity) are prone to be preserved in the stratum whose sedimentary rate is higher. According to calculation, the age of top boundary of the Member 1 of Shahejie Formation ranges from 31.5 to 32.5 Ma, and the age of top boundary of the Member 2 of Shahejie Formation is from 32.7 to 33.2 Ma. The ages of the uppermost strata of the Member 1 of Shahejie Formation of Chegu29, Che35, Chegu203, Dagu63 wells are 32.4, 32.4, 32.1, 32.5 Ma respectively.

Keywords: Chezhen Sag; Shahejie Formation; Milankovitch cycle; wavelet transform; sedimentary rate

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