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东海西湖凹陷始新统复合潮汐水道三维地震表征

李磊, 王小刚, 陈玲玲, 谭卓, 曹冰, 申雯龙 ▾

3-D Seismic Characterization of the Eocene Complex Tidal Channels in Xihu Sag, East China Sea

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摘要/Abstract

摘要 :

古潮汐水道作为沉积学研究与油气勘探开发的目标之一日益受到广大学者的重视。基于东海西湖凹陷X井区钻测井、三维地震数据,利用单井相分析、地震数值正演模拟、地震多属性分析及计算机三维成像技术,对始新统平湖组复合潮汐水道进行识别,并对其内部结构、外部形态、叠置样式及演化进行研究。主要取得3方面结论:①研究区潮汐水道呈NW向展布、宽500~1 000m、深2~10m,往返的涨潮流—退潮流致使水道侧向迁移、弯曲并形成点坝;②复合潮汐水道由底部滞留沉积—点坝—泥坪—煤层或点坝—泥坪—煤层8期沉积旋回组成,单一沉积旋回自下而上水体逐渐变浅、沉积物粒度由粗变细;③地震正演模拟及多地震属性结果表明,复合潮汐水道与周围围岩在地震波形、振幅、频率上存在差异。

关键词: 潮汐水道, 点坝, 正演模拟, 始新统, 西湖凹陷

Abstract:

Ancient tidal channel systems have been recognized and studied by many researchers and constitute an important target for sedimentary study and oil and gas exploration and development. Based on X-drilling data, logs, and 3-D seismic data of Xihu Sag, using facies analysis, seismic forward modeling, seismic attribute analysis and three dimensional imaging technology, the complex tidal channel of Eocene Pinghu Formation was identified and its internal structure, external morphology, stacked style and evolution were studied. Three main conclusions were made: (1) tidal channels were northwest trending, 500-1 000m wide and 2-10m deep. Flood and ebb currents could cause tidal channel meanders to laterally migrate and form point bars; (2) tidal channels were composed of eight sedimentary cycles: channel lag deposits—point bar—mud flat—coal marsh or point bar—mud flat—coal marsh. Marine regression was indicated by the fining-upward sequence in a single depositional cycle; (3) within the complex tidal channel system the seismic waveforms, amplitude, and frequency are different from those of the surrounding rock.

Key words: Tidal channel, Point bar, Forward modeling, Eocene, Xihu Sag

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