MGI018-05 会場: 304 時間: 5月23日16:25-16:40

石油探鉱開発における3D震探データと地球統計学手法に基づく3次元地下地質モデル

3D seismic survey data and geostatistics-assisted 3D subsurface geology models in petroleum industry

高野 修[1*], 辻 隆司[1]

Osamu Takano[1*], Takashi Tsuji[1]

[1]石油資源開発（株）技術研究所

[1]JAPEX Research Center

This paper attempts to introduce recent advances in 3D subsurface geology modeling technology applied in petroleum industry. In petroleum industry, obtaining precise subsurface geology model is crucial for successful exploration and development. In addition, multidisciplinary approaches, including geochemical basin burial history modeling, geologic structure modeling, stratigraphic modeling and reservoir modeling, are also required to simulate complex geologic features and processes. Notable characteristics in 3D subsurface geology modeling in petroleum industry may include effective integration of 3D seismic survey data and recently developed technology such as geostatistics, sedimentology and seismic geomorphology. Recent dramatic development of 3D seismic technology enables to obtain realistic subsurface geologic data, including paleo-depositional topography, reservoir distributions and reservoir properties, by means of attribute analysis, 3D visualization and seismic geomorphological technique. Horizon slice, time slice, surface analysis, seismic facies analysis and volume analysis including opacity rendering of geobody-indicating seismic attributes are major methods for 3D display of targeted geologic body and structures. Geostatistical stochastic modeling is a recently developed, effective method to simulate geologic bodies and properties quantitatively in a finer scale. The parameters are provided by 3D seismic attributes as soft data and by well petrophysics as hard data to simulate 3D property distributions with conditioning at the well location. Geological and sedimentological integration with geostatistical methods, such as multipoint, surface-based and process model-based geostatistical modeling, has recently been developed as an effective method to simulate precise geologic bodies.

キーワード:三次元モデル,地下地質モデル,三次元震探データ,地球統計学,サイスミック地形学,堆積学
Keywords: 3D model, subsurface geology model, 3D seismic survey data, geostatistics, seismic geomorphology, sedimentology