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High-Impact Cycle-Stratigraphy (HIC) A Method Applied in a Miocene-Pleistocene Subsurface Section, Northern Monagas, Eastern Venezuela Basin

This work documents the application of High-Impact Cycle-Stratigraphy (HIC) methods in Northern Monagas, Eastern Venezuela Basin and its influence on the identification of glacioeustacy processes, climatic changes phenomena, tectonic pulses effects and the interaction between them in continental to shallow marine molassic paleoenvironments.

High-Impact Cycle-Stratigraphy has been defined as the integration of a wide range of data, including biostratigraphy, sedimentology, well-log and seismic data. Detailed studies of the biostratigraphic assemblages distribution tied to sedimentology and well log stacking patterns allows to recognize cycles using them like a powerful correlation criteria that increases its significance when is coupled with seismic data. The result is a high-impact correlation tool that not only allows to understand stratigraphic processes but also helps to define the basin geometry.

Using this criteria, it was possible to identify 400 and 600 ka apparent cyclic periodicity in the three studied wells, it was associated with Milankovith cycles (excentricity) and tectonic effects. Due to the molassic character of this stratigraphic interval, the systematic study of palynological assemblages and their percentage variations through the stratigraphic column were the key factors in this study. This records can identify the flora paleobelt migrations and use them as a criteria to define cycles.

The well cycles distribution were plotted on 2D seismic sections, projecting the cycles extension and showing that the seismic horizons geometry and the cycles distribution on the wells have a perfect match. It is the first time that this detailed correlation allows to reconstruct the geological history of this area.