

## **Quantitative approach to paleostructures in the Paraná Basin, Brazil**

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The identification of paleostructures constitutes a difficult deal in sedimentary basins at the initial exploration stage, mainly due to insufficient data. In the Paraná Basin, Brazil, geostatistical tools associated to other quantitative methods were applied in order to model the spatial and directional variability of thickness taken from chronostratigraphic units. These units were defined as hemisequences meaning that one boundary is defined by unconformity and the other one by isochronal minimum sedimentation surface. If the hemisequences are base unconformity bounded, the anomalous directional change of thickness were interpreted as fault controlled differential subsidence. The data were submitted to trend surface analysis in order to take off the regional flexural component of second or third order. The search for maximum continuity of thickness was done by variographic analysis and modeling of the residuals. The anisotropic property was used to estimate the hemisequence residual geometry by kriging. First and second degree derivatives of kriged estimated surface were used respectively to map faults and structural highs and lows. The same procedure was used for gravimetric data to map basement discontinuities, highs and lows. The results show a northeast structural trend for Lower Devonian; northeast and northwest trends in Mississippian; northwest structures were active in the Pennsylvanian and Triassic-Jurassic; large N45E structures, in late Permian to early Triassic; N40E and N45W during Triassic corresponding to distension time in west Gondwana; northeast structures were active in all periods analyzed, mainly in the Pennsylvanian followed by late Permian to Triassic. (Supported by PADCT 65.95.0303)