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**Identifying Subtle Stratigraphic and Facies Trends Using Advanced Variography**

The mathematical characterizations of petroleum reservoirs using geostatistical principles require models of spatial continuity such as the variogram. Traditional variography is a two-point statistic and can be displayed as a graph of the variance $\gamma_{(h)}$ against separation distance between well-pairs (lags). The graph is produced numerous times selecting pairs along various azimuths until the maximum direction of continuity is identified. This azimuth along with its perpendicular constitutes the variogram model. However, it is possible for multiple secondary directions of continuity to exist that are equally important but difficult to see using the above procedure. For example, in a near shore mesotidal regime, the principle direction of continuity could be represented by an azimuth parallel to the shoreline. Inlet, or channel systems representing changes in stratigraphy or facies, may represent secondary continuities that occur at shorter lag distances. To visualize multiple directions of continuity, a variogram map may be constructed. Unlike the traditional 2-D variogram, multiple azimuths are displayed as radial lines initiated from a common origin in a "map" view. The origin is located in the center of the map and the changes in variance $\gamma_{(h)}$ are plotted for each lag along each line. The values are contoured or rendered with different colors. If vertical information is included, the variogram map can be produced in 3-D. The construction of 2-D and 3-D variogram maps simplifies the parameterization of the variogram necessary for reservoir characterization software, and allows for more detailed modeling of important subtle trends. Methodology and examples are shown.