Geocentric Sectoring of LWD Azimuthal Log Data for Improved RDIP and RSTRIKE Analysis: Enhanced Reservoir Navigation and Petrophysical Characterization

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ABSTRACT

We propose an improved approach for the sectoring (angular partitioning) of LWD azimuthal log data. Our technique defines the sector partitions within a geocentric system. Stratigraphic up and stratigraphic down sectors are defined such that they are perpendicular to bedding, yielding enhanced bed boundary detection and improved relative dip angle (RDIP) calculations. Likewise, stratigraphic left and right sectors are defined such that they are parallel to bedding, yielding refined relative strike (RSTRIKE) extractions for higher resolution petrophysical analysis. Initial sector settings could be pre-set from existing data (e.g., seismic data and subsurface contour maps). Azimuthal data acquired while drilling would reveal if the sectoring goes off-centered due to formational or wellbore orientation changes, allowing sectoring adjustments via downlink command to resume the geocentric sectoring.

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