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AN IMPROVED BOREHOLE TELEVIEWER SYSTEM: IMAGE ACQUISITION, ANALYSIS AND INTEGRATION

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Borehole imaging devices can provide valuable information to aid reservoir descriptions. Applications include fracture identification, stratigraphic interpretation and thin-bed analysis. The imaging devices range from video cameras for use in air-filled or clear-fluid-filled boreholes, to resistivity scanning devices for use in conductive muds, to circumferential acoustic imaging devices for both conductive muds, to circumferential acoustic imaging devices for both conductive and non-conductive mud systems.

A circumferential borehole imaging device utilizes a rotating transducer operating in a pulse-echo mode to scan the entire circumference of the borehole wall. Variations in lithology, physical rock features (such as fractures, vugs, and laminations), and borehole geometry cause changes in the measured amplitudes and traveltimes, collectively providing a map, or image of the borehole wall. Although the instrument provides total borehole coverage, and can be used in fresh and oil-base muds, application has been limited in the past due to poor image quality, slow logging speeds, and mud weight restrictions.

An improved borehole imaging system (Circumferential Borehole Imaging Log - CBIL) has been developed which incorporates an improved transducer design, operating at higher data sampling rates. High quality images are obtained with improved vertical and horizontal resolution in an expanded range of borehole sizes and mud weights.

This paper addresses various applications of the new instrument, with particular emphasis on integrated approach to borehole televiewer interpretation in combination with other geophysical data.

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