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Borehole Imaging in Non-Conductive Muds: Two Years Later

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This presentation provides comprehensive overview of the development and successful application of a new oil-base micro-resistivity imager. We will present numerous field examples collected over the past two years to demonstrate the instrument's functionality and applications throughout a range of geological environments and borehole conditions.

Recent developments in drilling technology as well as ambiguous exploration and development strategies have necessitated the use of non-conductive mud systems to improve drilling efficiency and reduce borehole stability problems. While the higher penetration rates and more stable and better gauged wellbores provided a significant savings on drilling that, of course, has major impact on well economics, the growing use of non-conductive mud systems have hitherto provided an environment that precludes the use of conventional micro-resistivity borehole imaging. This leaves conventional coring as the only but costly alternative for detailed reservoir characterization. Thus, it was imperative to develop a new micro-resistivity borehole imaging technology that works well in non-conductive mud systems.

The EARTH Imager brings the well-established performance of existing micro-resistivity imagers to the non-conductive mud arena. The implementation of two unique and innovative technologies, electrical energy coupling and non-planar focusing, matched with an optimized sensor array geometry resulted in this new micro-resistivity borehole imager that acquires image data sets of high vertical and azimuthal resolution. The combination of the fine resolution of its measurements with the large borehole coverage makes the EARTH Imager particularly suitable for the most demanding imaging applications, such as fracture systems characterization and sedimentological analysis.