EUROPEAN GEOPHYSICAL SERVICES

OPTICAL IMAGER TOOL

A precision-machined prism and CCD camera assembly permits a high definition optical image of the borehole wall to be captured in a variety of horizontal and vertical resolutions.

The resulting image is digitised in the tool fof transmission to the surface acquisition system.

The image is then orientated to North and displayed as an unwrapped image log. This enables a detailed structural interpretation to be made if required.

For the best results the optical imager should be run above the water level or in clean, clear fluid.

The logging tool is centralised during data acquisition by two sets of bowsprings, which are adjusted for a variety of borehole diameters.

The image is viewed and recorded on the way down the borehole so as to limit disturbance to the clarity of any water that is present.

The orientation system employs a flux gate magnetometer and therefore data within approximately one metre of magnetic steel casing is un-orientated.

Specifications

Size:	1780m x 60mm
Weight:	7kg
Tilt:	0° - 90°C
Azimuth:	0° - 360°C
Vertical resolution:	User defined up to 0.1mm
Horizontal resolution:	User defined up to 1800 pixels/360°
Color resolution:	24 bit RGB
Max. temperature:	70°C
Max.pressure:	20MPa

Borehole Conditions

Minimum diameter 75mm
Maximum diameter 500mm
Dry or clear water filled
Unlined

Logging Conditions

0.5 - 2 m/min
Centralised

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PROCESSING AND PRESENTATION OF IMAGER RESULTS

Detailed logs of the imager data can be produced at any vertical scale, though 1:20 is com-monly used. All images are referenced to Magnetic North. The inclination and azimuth of the borehole are also presented.

The image of the borehole wall is presented in an unwrapped form with a horizontal scale marked 0° - North, through 90° - East, 180° - South, 270° - West, back to North.

Structural features and discontinuities are hand picked from the images in the form of colour coded sinusoidal projections. Defect classifications can be tailored to suit. (see below for a typical example).

Discontinuities that are **non-sinusoidal** are not picked so that misleading results are avoided - these features do not have a linear dip or direction. This structural log is presented as 'Discontinuities' with a horizontal scale marked 0°, North, through 90°, East, 180°, South, 270°, West, back to North.

Using the borehole diameter, tilt and azimuth, along with the geometric parameters of the sinusoids, the **true azimuth and dip** of the discontinuities are calculated and presented as a "tadpole" plot (True Dip °). The horizontal position of the tadpoles head gives the defects' true dip angle and its tail points in the direction of the defects azimuth. These logs are pre-sented with a horizontal scale in degrees. By convention the top of the page is North (Magnetic) and the right hand edge of the paper is East. This true dip data can be exported as ascii or excel data files.

Additionally, rose diagrams, stereonets, frequency histograms and contour plots of the dis-continuities can be produced.

Defect Classification

Defect Type	Colour	Classification Parameters
Major Fracture or Fissure	Blue	A defect that is **continuous** across the entire image. Defines a break in the formation normally stress re-lated. The break may be open and/or filled with soft-er material such as clay.
Minor Fracture or Fissure	Turquoise	A thin or faint defect that is **continuous or discontinu-ous** across the image. Defines a thin or closed break in the formation nor-mally stress related.
Vein	Green	A subtle defect that is **continuous or discontinuous** across the entire image.
Fabric	Red	Formation related defect that is generally **continuous** across the image. Defines a feature generally metamorphic, igneous or sed-imentary in origin. Such as bedding and cross-bedding. These features can give similar responses to minor frac-tures or fissures.
Unknown	Black	Faint features which **can not** be classified.

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