terratec

Geophysical Services

terratec group & spin offs

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Geophysical Services

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TEC-CORIM GmbH
OPTICAL CORE IMAGER

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Company Profile

terratec geophysical services offers surface geophysical and borehole logging services worldwide. Our main objectives are the acquisition, compilation, processing, analysis and the interpretation of geophysical data.

We execute these services in the mineral exploration, ground water prospecting, geothermal energy prospecting and geotechnical fields.

terratec geophysical services was founded in Germany in 1989 and consists of 35 geophysicists and geologists who are fluent in a great variety of languages, including English, German, French, Spanish, Bulgarian, Russian and Arabic with bases in Germany, Bulgaria, Namibia, Mali Niger and representatives in Austria, Sweden and Finland.

terratec geophysical services has comprehensive working experience in many countries and climates from Greenland to Namibia. Staff and geophysical systems have been optimized and adapted to harsh conditions in remote areas.

terratec is able to field over 17 logging systems. Specialist down hole tools include optical and acoustic borehole scanners, spectral gamma, deviation tools (used in open boreholes and within the drill string), induced polarisation, flow meter and many more. We log routinely down to depth of 2000 meters.

Surface geophysics is represented by the principal methods of induced polarisation, both 2D and 3D with the in house development of the HIRIP method (high resolution induced polarisation), surface to hole and hole to hole IP, ground gravity, time and frequency domain EM, NSAMT, magnetics and radiometrics.

Mining

Ground water

Geotechnical

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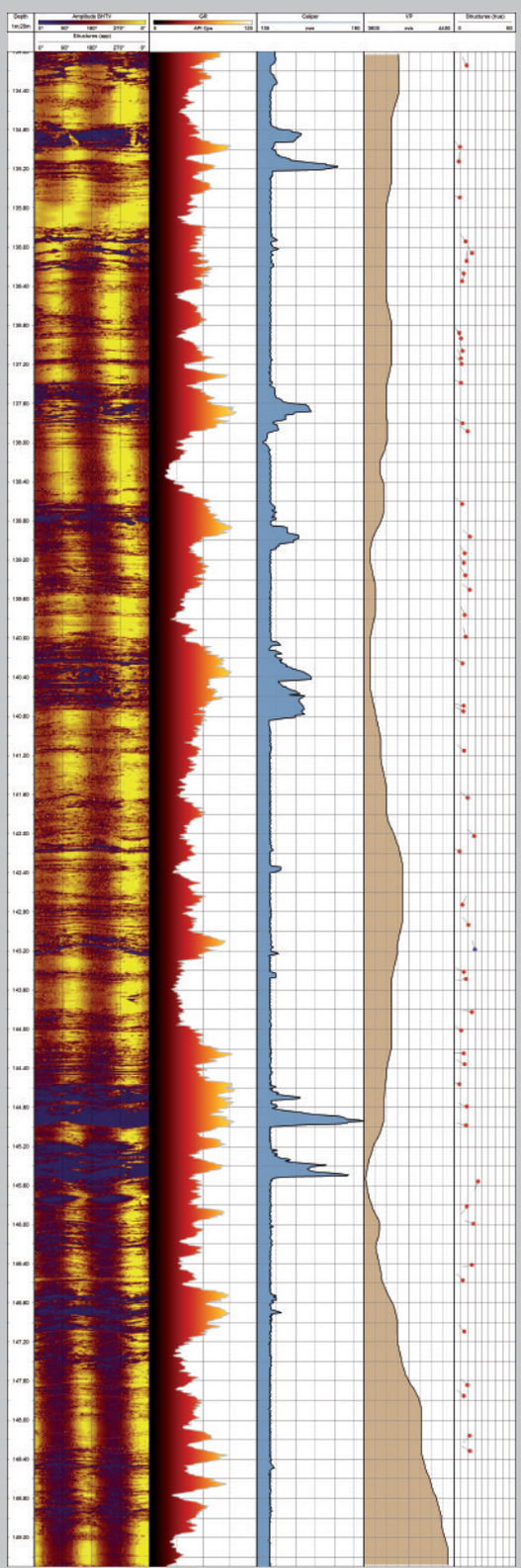
Borehole logging from 0 - 2000 m

terratec offers the following borehole geophysical measurements:

- Optical borehole scanner (OPTV)
- Acoustic televiewer (BHTV)
- Flowmeter (fluid logging)
- Wireline water sampling at particular depth
- Fluid temperature and conductivity
- Caliper
- Natural gamma ray (total count)
- Uranium grade
- Spectral gamma ray
- Sonic (FWS, CBL)
- Borehole deviation (magnetic and gyro)
- Total magnetic field (Hx, Hy, Hz)
- Resistivity and IP
- Dual induction rock conductivity
- Borehole EM (Digi-Atlantis, Geonics BH43-3B)
- Video inspection

Others on request...



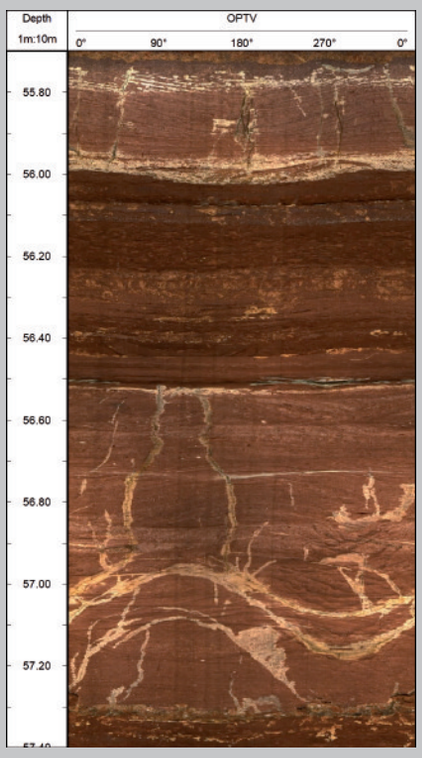
Borehole logging, Mauritania

Optical Borehole Scanner (OPTV)

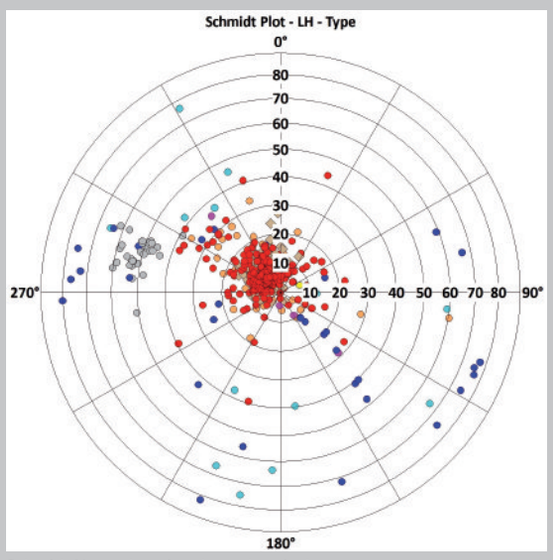
Capabilities of the Optical Scanner include:

- Continuous, detailed and scaled 360° true-colour images of the borehole walls for documentation and interpretation (see fig. on the right)
- Feature analysis including dip, strike, frequency, and fracture aperture
- A popular visual data display option is the projection of features onto an imaginary
- Replacement of expensive coring with its associated problems of incomplete core recovery
- Borehole deviation log (dip and dip direction) to calculate the true borehole coordinates x, y, z for the production of bulls-eye diagrams, etc.
- Total magnetic field strength and magnetic field vector information
- Natural gamma ray information
- 150 m scan within 1 hour with a vertical resolution of 1mm
- Over 19 years of experience in Africa, Europe and America
- Surface and underground, vertical and horizontal, core and RC drill holes
- Portable and vehicle mounted operation

Borehole logging, northern Finland



The image shows the circumference of the borehole developed on a plane. The left and right borders of the image correspond to north (0° or 360° respectively); the middle of the image corresponds to south (180°). A structure analysis of the images is possible and the resulting polar projections show the dip direction and dip of the structures for example in a Schmidt Net.



Schmidt Net, pole points, lower hemisphere

Contact:

Borehole logging, rock laboratory

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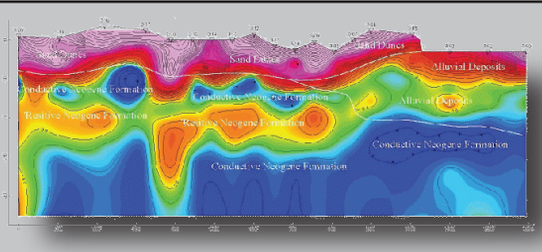
Surface Geophysics



Conductivity Depth Section. High Resolution, Off Loop, Time Domain Soundings.

The section maps out a complex geology consisting of sand dunes over alluvial and Neogene Formation layering.

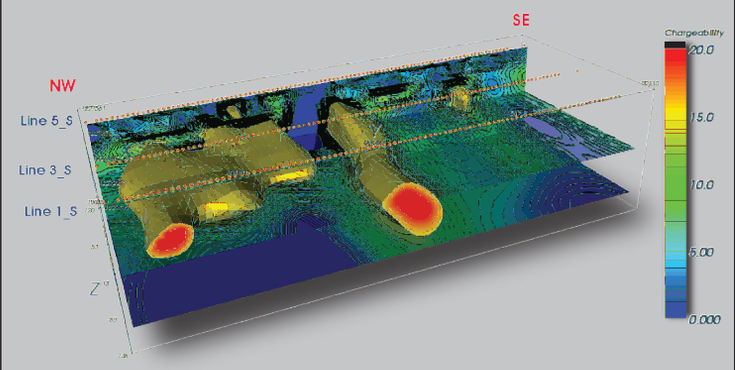
Time Domain EM (TDEM)

- Multiple Zonge GDPII receivers with up to 16 channels
- Multiple Zonge GGT transmitters and generators
- Protem EM47, EM37 and EM57 transmitter with Analog Protem Receiver
- Downhole Surveying using Protem downhole probes: BH43-1D, BH43-3D, BH43-3B
- Specializing in Large Loop surveys for massive sulphide mineralization
- B field fluxgate surface and downhole measurement
- Modelling using Maxwell and Interpex software
- Geologically relevant interpretation of TDEM data

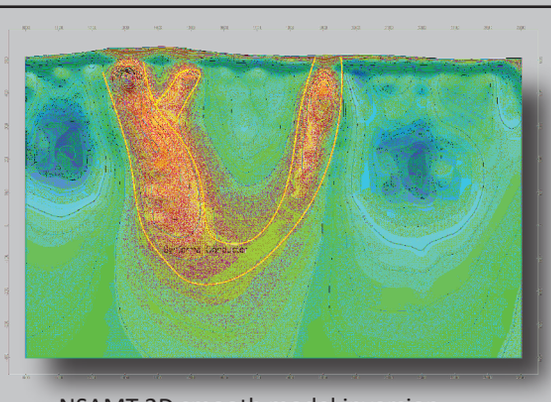
HIRIP - High resolution IP

HIRIP – High Resolution Resistivity and Induced Polarisation is a new methodology combining classic Pole-Dipole and advanced multi-electrode measurements

- 10 times higher data density compared with Pole-Dipole resulting in better modelling of the data
- 1000 m profile with 10 m Electrode spacing per day
- Advanced 3D modelling and visualisation of HIRIP profiles including drillholes
- Output to mine planning software packages



HIRIP 3D model, chargeability.



NSAMT 2D smooth model inversion

NSAMT and CSAMT

This hybrid EM resistivity technique is effective in delineating targets ranging from super-conductive Ni sulphides to poorly conductive (100-1000 Ohm.m) sulphide or pregnant/target lithologies. Depths of penetration are in the range from 300-500 m. The method is especially effective in delineating 2-2.5 dimensional targets or structures. The combination with standard Pole-Dipole or HIRIP survey gives a distinct exploration advantage in terms of resolution, depth of penetration. This combination of techniques works especially well in brown field exploration.

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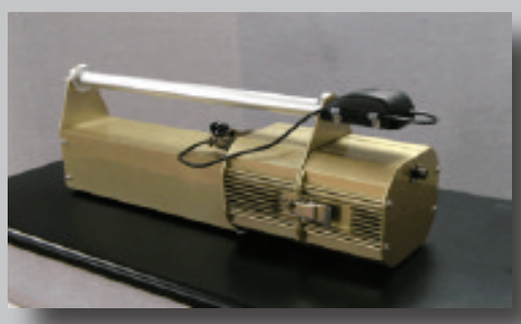
Ground Gravity, Magnetics, DGPS and Radiometrics

Ground Gravity

- Gravity surveying throughout Africa (DRC, Mali, Tunesia, Mauretania, Namibia, Angola, etc)
- Scintrex CG3-M gravity meter, accuracy 0.02 - 0.05 mGal
- In-field processing to terrain corrected Bouguer values using Oasys Montaj
- Kimberlite, Base Metal and Engineering/Environmental applications

Magnetics and Radiometrics

- Walking ground magnetics with GEM GSM19 Walk-Mag linked to Garmin handheld GPS
- Walking spectrometer reading using Pico Envirotec GRS-2 Spectrometer
- Up to 30 km per day of surveying in desert environment
- High definition ground grids for the Uranium Industry



DGPS Surveying

- Trimble RTK equipment with high power base station and booster
- Accuracy 1 - 2 cm
- Tied in seamlessly with gravity surveying
- In forest areas augmented by Trimble DiNi Digital Level
- Measurement of DTM's and Borehole coordinates

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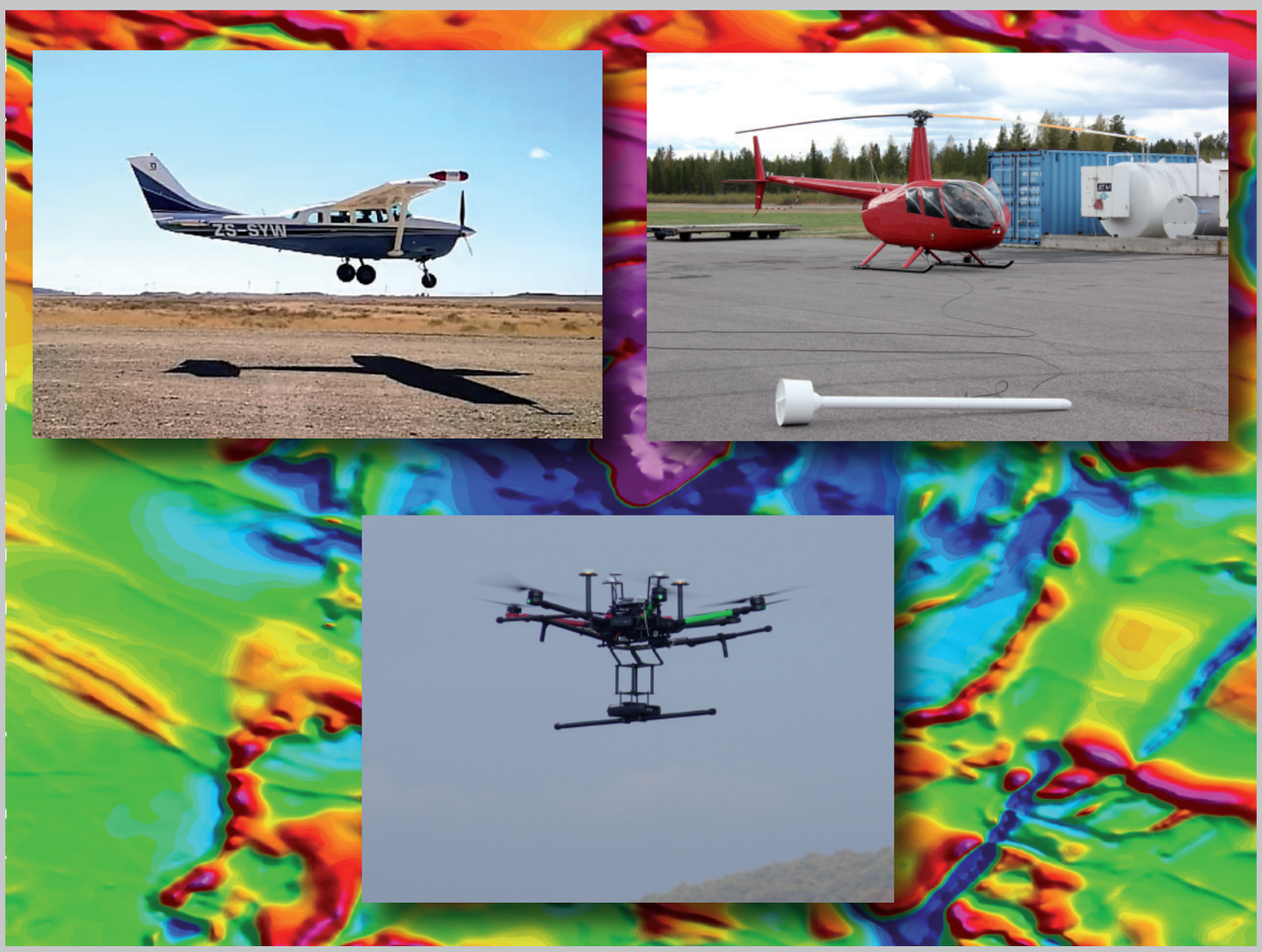
Airborne Geophysics in Europe and Africa



High resolution Magnetics and Radiometrics on low cost light platforms

Fixed Wing Helicopter UAV

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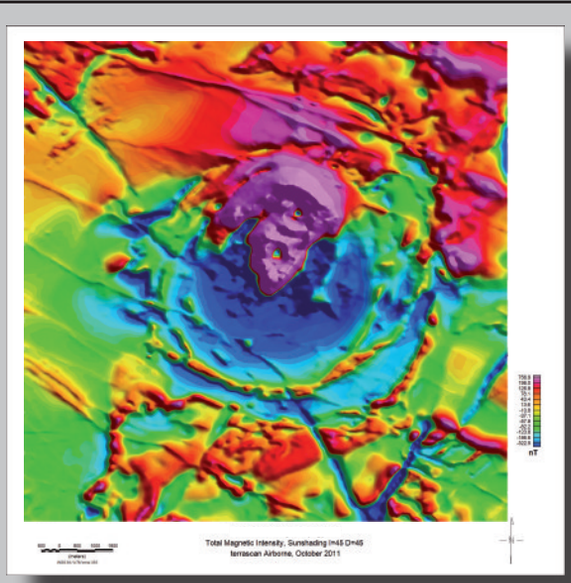
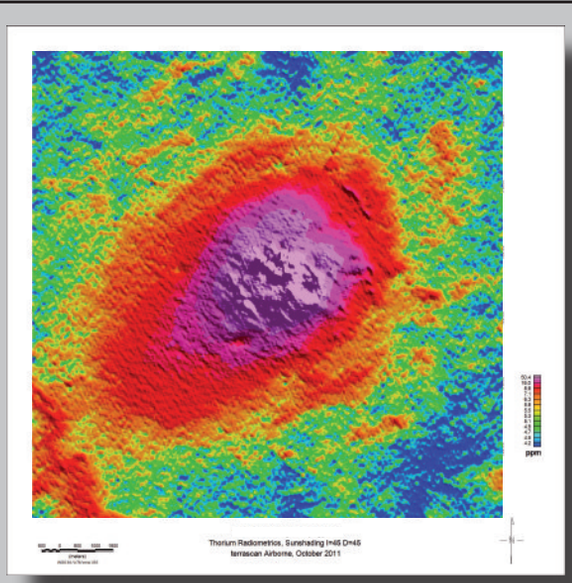
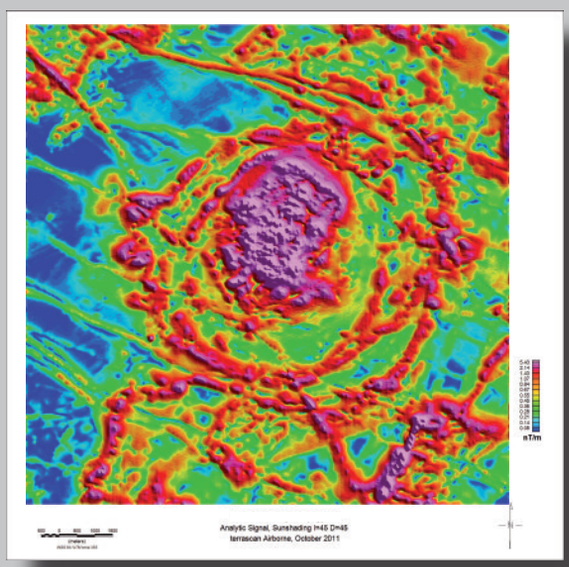


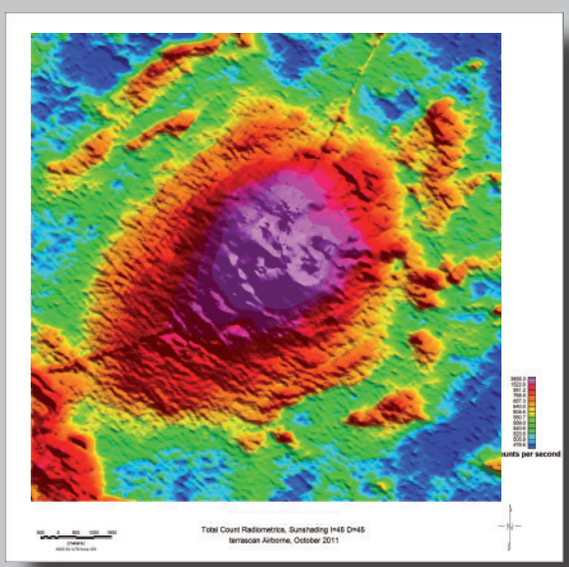
Total Magnetic Intensity



Thorium Radiometrics



Analytic Signal



Total Count Radiometrics

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Affordable continuous core images with TEC-CORIM Software

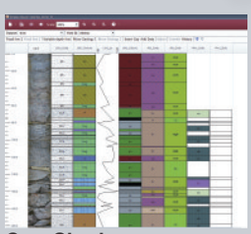
You need:

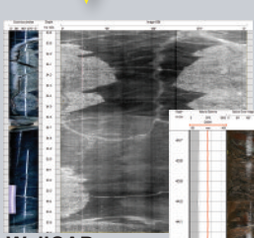
+

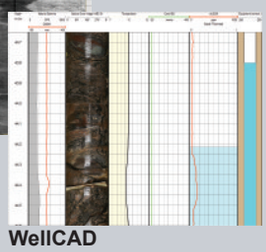
+

You get:

- ✓ Continuous core image with adjustable depth scale
- ✓ Geometrically corrected images with standardized file name structure
- ✓ Free viewer software
- ✓ High quality digital archiving
- ✓ Images can be used by many software packages e. g. WellCAD - ALT, CoreShed - Maxwell GeoServices (ask for more)


CoreShed


WellCAD


WellCAD

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OPTICAL CORE IMAGER

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TEC-CORIM - Standard Processing Routine

4 easy steps to produce and view your continuous core image with adjustable depth scale:

1. Image acquisition

- An image of each box is made
- As the images are produced they are associated with the borehole ID and box number in the software provided

2. Image calibration

- The geometrical distortion of the raw image is removed and the background around the box is cropped

3. Cutting the image into core strips/ single runs

- Rectangles let you define the right core/run dimension to be cut
- Depth is assigned to rectangles
- Core loss is accounted for
- Areas outside the core strip/run are cropped and depth information is associated with the file name

4. Display continuous core

- A free Viewer software is used to arrange the cores/runs in a continuous column which can be viewed
- Depth scale can be adjusted
- Continuous core can be linked together with other logging data, geochemical data, etc. for use in other logging or database software

✔ **easy to operate**

✔ **core photography: ~ 150 - 200 boxes/day**

✔ **processing: up to 80 - 100 boxes/day (≙ up to 400 - 500 m/day with 5 m/box)**

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