

HYPERSPECTRAL MSCL

The SpecCam 4 hyperspectral camera uses real-time imaging infrared spectroscopy to identify and produce semi-quantified maps of different polytypes of clay, carbonate and sulphate mineral species from the surface of rock cores and cuttings. The acquisition of a continuous dataset allows for the production of mineral distribution maps to spatially understand the impact of clay, carbonate or alteration minerals for the geological assessment of oil and gas reservoirs or mineral exploration sites.



The SpecCam 4 hyperspectral camera is available on any of Geotek Multi-Sensor Core Logger (MSCL) platforms (MSCL-S, MSCL-XZ or MSCL-XYZ) and now uniquely offers the ability for users to acquire hyperspectral datasets along side XRF, magnetic susceptibility, VIS and UV core imaging, and even density/porosity, P-wave velocity or spectral natural gamma all on one core logging platform.

APPLICATIONS

Oil and Gas

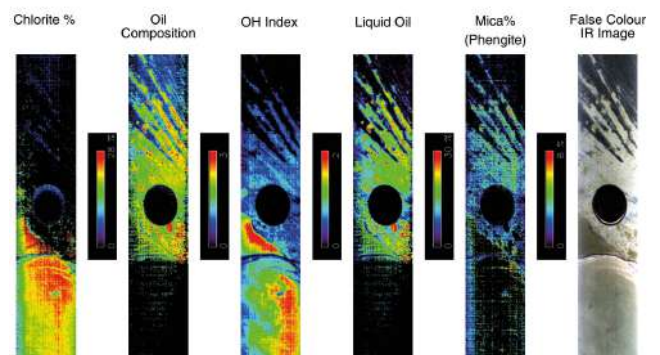
- Determine spatial distribution of liquid and solid hydrocarbons
- Discriminate and semi-quantify polytypes of swelling and non-swelling clays, carbonates and sulphates
- Identify core intervals where mineralogy controls permeability
- Use a tool to plan for more focussed plugging or well planning

Mineral Exploration

- Alteration mineral mapping to identify temperature and chemical zoning
- Provision of mineral abundance and ratios such as: clay fractions, phenocrysts and xenocrysts in kimberlite, breccia and conglomerates
- Distinguish weathering vs alteration clays
- Identification of asbestiform minerals
- Discrimination of serpentine group, micas, kaolin group, chlorite-epidote group and more

Research and Academia

- Determine spatial distribution of minerals at high resolution (0.5 mm x 0.5 mm)
- Discriminate and semi-quantify polytypes of clays, carbonate species and alteration mineralogy and compare against XRF datasets
- Superb spectral resolution (1 nm at 2200 nm) to better distinguish mineralogy species
- Fully supported interpretation software for customised spectral libraries



SpecCam 4 Technical Specifications

Spectral range offered 400 nm to 2500 nm

State-of-the optic and grating arrangements with spectral supersampling tunes resolution to specific wavelengths for better mineral interpretation. Maximum spectral resolution is 1 nm at 2200 nm.

Standard image resolution is 0.5 mm x 3 mm (although larger pixel sizes are possible for lower resolution studies)

Continuous coverage high image resolution is (0.5 mm x 0.5 mm)

Speed ranges between 1 m and 4 m per hour depending of resolution selected

Bespoke spectral library and interpretation software, which includes spectra from the USGS and Aster spectral databases

MINERALOGICAL IDENTIFICATION:

- Quantify each clay type
- Derive total clay
- Identify Kaolin polytypes e.g. low-high crystallinity, halloysite, dickite
- Determine Fe: Mg ratio of chlorites
- Define subtle changes in compositions of illites and micas
- Serpentine Group - Lizardite, Crysotile
- Sulphates - alunite, jarosites, borates Chlorite-epidote group
- Identify illite polytypes and distinguish 1M and 2M types to help identify authigenic/detrital origin
- Identify illite/smectite ratios to provide information on temperature history
- Determine smectite discrimination and identify Fe, Mg and Ca types
- Identify mica types e.g. paragonite, muscovite, phengite
- Identify alteration clay minerals that can be distinguished against background mineralogy
- Identify different carbonate species such as: calcite, dolomite etc

COMPATIBLE SYSTEMS

MSCL-XZ



The MSCL-XZ is a benchtop or small-footprint core logging system that provides a compact solution for split core non-destructive measurements, obtaining multiple data sets simultaneously.

MSCL-XYZ



The Geotek Core Workstation (MSCL-XYZ) is a unique automated multi-core logging system for XRF, core imaging and various other surface core measurements. Multiple core sections (up to six 1.5 m core sections), or core boxes are loaded into the workstation, which are then logged in a single operation.