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1 *Making digitized thin section available through virtual polarization microscopy.*

PETROSCAN II: SYSTEM FOR VIRTUAL POLARIZATION MICROSCOPY

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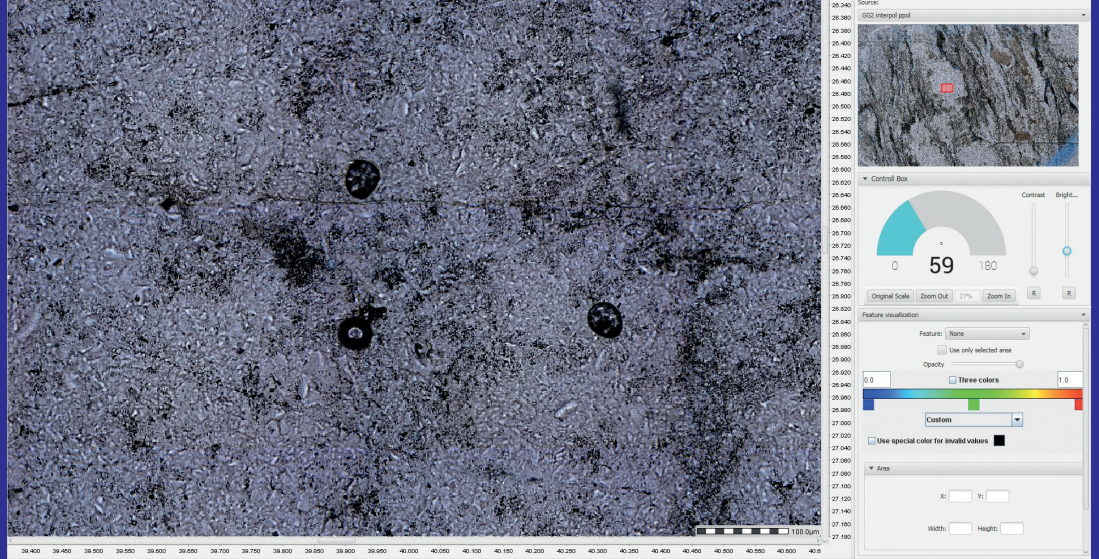
Unique Selling Point

The unique and innovative character of the PetroScan system results from the interaction of hardware and software based on the Kansy interpolation developed at Fraunhofer FIT. The Kansy interpolation calculates the representation of pixels between defined polarization angles, which serve as supporting points. Only supporting points have to be recorded from the sample, accordingly the scan is accelerated and at the same time the amount of data generated is significantly reduced. Based on the generated data, samples can be viewed in a virtual microscopy environment with freely adjustable image magnification and polarization angle. The combination of the Kansy interpolation with the virtual microscopy environment enables experts to access digitized thin section samples regardless of location and without loss of information.

PetroScan Polarization Microscope

The optical design of the PetroScan microscope is based on the principle of classical polarization microscopy, using high-quality optical and mechanical components from well-known manufacturers. Using a motorized polarizer analyzer module, images can be captured in brightfield with cross-, circular- and unpolarized light in automated operation with commercially available objectives from 5x to 63x magnification. The images are acquired by a low-noise, peltier-cooled True Color CCD camera. A motorized XYZ precision stage enables the scanning of thin sections with dimensions of up to 130 x 85 mm. The large Z-travel range of up to 50 mm renders the examination of strongly voluminous samples in polarized incident light possible.

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PetroScan Visualization Software

The PetroScan visualization software makes it possible to view each sample in its entirety or in a magnified display at any adjustable polarization angle in the Tile Viewer after the thin sections have been digitized. The data sets can also be transmitted, so that the digitized thin section samples can be viewed and analyzed at any location, provided a suitable system with Tile Viewer installed is available.

Innovations with PetroScan II

An essential factor for the time required to scan a thin section is the total number of tiles needed to display the overall picture of the sample. Therefore, the illumination for

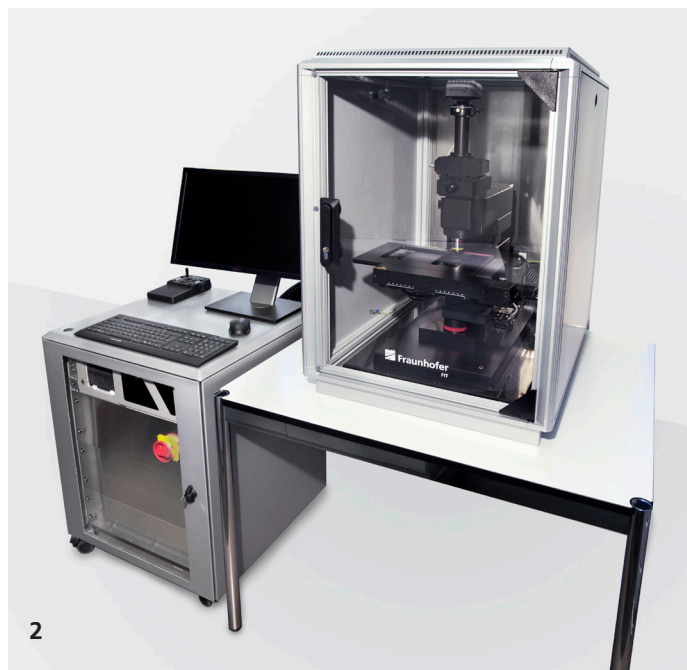
the second version of the PetroScan system was fundamentally revised and now allows larger parts of the sample to be imaged on the CCD chip per tile recorded. In addition, the revised illumination allows homogeneous illumination of the field of view of objectives down to 5x magnification, whereby this is imaged full-frame on the 1" chip of the newly integrated 6 megapixel True Color CCD camera. The combination of revised illumination, new camera and lower resolution lenses results in a significant acceleration of the scan process compared to the PetroScan I system (min. 10x faster, with the same settings). For example, PetroScan I requires 5 h 10 min scanning time to acquire a 39.8 x 20.3 mm thin section area. With PetroScan II scanning time would be reduced to approximately 30 min for the same sample under identical conditions.

Features:

- 10x faster than PetroScan I
- Fast scanning of a broad interval of polarization angles
- Large scanning area (0 to 180°, accuracy 1°)
- Brilliant color imaging
- Small data storage requirements without loss of information
- Intuitive software suite
- Virtual polarization microscopy environment
- Access, visualize and analyse data anywhere via standard network protocols
- Optional upright polarization illumination

Technical Data:

- Stage: Motorized XYZ precision stage, total range 130 x 85 x 50 mm (X/Y/Z)
- Objectives: Standard microscope objectives, magnifications from 5x to 63x
- Camera: Peltier-cooled 6 Megapixel True Color CCD camera, chip dimensions 12.5 x 10.0 mm (H/V), chip diagonal 16 mm (1")
- Field of view: depending on magnification (5x/63x) 2.5/0.2mm (H) and 2/0.16mm (V)
- LED light source: Transmitted light illumination based on modern, bright LED light source providing faithful color temperature representation and homogenous illumination



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- 1 Screenshot of virtual polarization microscopy environment (Tile Viewer)
- 2 PetroScan polarization microscope system