SPECTRUM

News from Quantum Design Europe

Edition 37 | December 2021

The CryoCore – Optical cryostat for small money

With the CryoCore, Montana Instruments MI for the first time offers an affordable entry-level system. Base temperature and vibrations are slightly higher than in the Cryostation, but still beat most other cryostats by a significant margin. The number of options has been reduced, but the CryoCore basic system comes with extensive basic equipment: 5 viewing windows, 12 DC and 2 RF feedthroughs with corresponding sample holder are already included. Like all MI cryostats, the CryoCore is a turnkey system. Vacuum system, temperature controller, cold head, helium compressor and a PC with touch screen form part of each cryostat system.

In the same way as an optical component, the CryoCore can be installed directly on the optical table, without the need for an external suspension. The temperature of the sample is regulated with efficient conduction cooling. The cryostat is fully automated: Simply set the desired temperature on the touchscreen and the CryoCore will evacuate the sample chamber, cool it down and stabilize the temperature.

The CryoCore is the right choice for all users who are looking for an affordable yet powerful entry-level cryostat for sensitive optical measurements.

Specifications

- Temperature range: 4.9 K - 300 K
- Vibrations (peak-to-peak) < 100 nm
- Closed helium cycle

Please contact us
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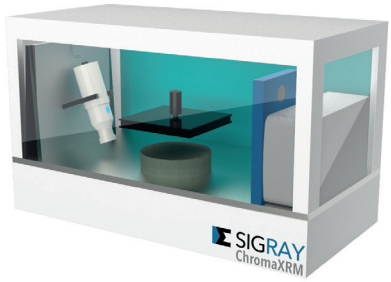
ChromaXRM-500 – A µCT system designed for life sciences and polymer materials

With the ChromaXRM-500, Sigray introduces a CT system specifically designed for the requirements to be met in life sciences and the demands posed by polymer materials. The samples to be measured in these areas typically have very low contrast in the X-ray region, thus presenting a real challenge. The ChromaXRM-500 achieves a resolution in the submicron range (<300 nm voxel size) and can be fitted with up to five different detectors.



The X-ray tube installed in the ChromaXRM-500 is unique. It can be equipped with five different target materials to cover a wide energy range and to specifically use the target that provides the highest possible contrast for the sample to be measured. This "tailor-made" choice can increase throughput

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Quantum Design EUROPE

ChromaXRM-500 – A µCT system designed for life sciences and polymer materials

» and contrast by a factor of up to 10x. For an example, look at Fig. 1: It shows images of the same sample taken with three different target materials. The image on the left was taken with a chromium target and shows high contrast, but low penetration of the sample. The image in the middle shows the same sample taken with a copper target. The comparison shows that here, both contrast and penetration are optimal. The picture on the right shows the sample with a tungsten target. Penetration is very good in this case, but the contrast is significantly lower.

Especially in the field of life sciences, X-ray microscopes belong to the more unsuitable systems when compared, e.g., to optical microscopes. X-rays are considered to be too powerful to examine tissue samples/soft tissue. However, with the ChromaXRM-500, high-quality images of unstained tissue samples can be taken by using a chromium target. As an example, Fig. 2 shows an image of liver cells.

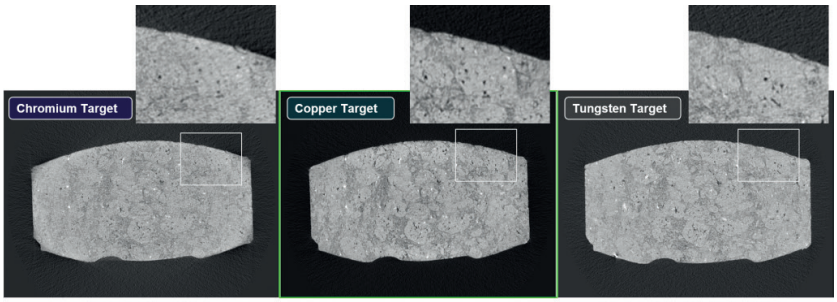

Fig. 1

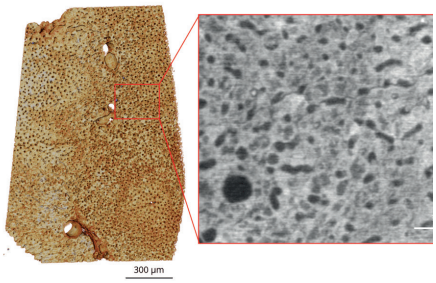

Fig. 2

Another example of materials that are difficult to examine are so-called low-Z materials, i.e. materials with a small atomic number such as carbon fibres or polymers. Here, it is also possible to achieve a significantly higher contrast in comparison with the contrast achieved with a standard radiation source based on a tungsten target.

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Neonatal jaundice – Controlling bilirubin therapy lighting

After birth, the body of the newborn infant breaks down excess red blood cells. During this process, the yellow-brownish pigment bilirubin is produced as a by-product. If this pigment cannot be broken down by the still immature liver, its level in the blood rises and it is deposited in the tissues. The skin and the eyes turn yellow. This neonatal jaundice is usually harmless and subsides within a few days.

However, in one in 50 newborns, the bilirubin level rises to the point where it needs to be treated. Fortunately, there is a simple light therapy in which the almost naked baby is placed in an incubator under blue light with a wavelength of 460 nm.

This causes a chemical conformational change in the bilirubin stored in the newborn's skin. During this process, the initially water-insoluble indirect bilirubin is converted into a readily water-soluble structural isomer that can be excreted without difficulty in the bile.

Of course, the intensity of this therapy light should be checked regularly. For this purpose, ILT has two bilirubin light meters in its product range — the ILT750-Bili and the ILT750-BILI454 BiliBlanket (replacing the discontinued Ohmeda BiliBlanket II light meter).

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The CryoAdvance – The next generation of the Cryostation optical cryostat

For ten years now, the Cryostation from our partner Montana Instruments (MI) has been the first choice for sensitive optical measurements.

The system combines a base temperature of 3.2 K with 5 nm vibrations (peak-to-peak) in a closed-helium cycle. The cryostat can be mounted directly on the optical table, as the cold head is vibration isolated against both the table and sample chamber. MI have now launched the next generation of Cryostations: The CryoAdvance series. These systems feature improved embedded electronics.

External control options have been expanded: Control via REST API, examples for MATLAB, LabVIEW and Python now are included in the system. Temperature controller and vacuum system are accommodated in a convenient 19" rack to save space in the labs that are often small.

The high mechanical stability and the low base temperature make the CryoAdvance an ideal tool for quantum transport measurements and applications with similarly high demands. Even with heat loads from positioners and feedthroughs, the temperature still remains well below 4 K, which is a critical threshold for many experiments.

- Temperature range: 3.2 K - 350 K
- Vibrations: 5 nm (peak-to-peak)
- Cooling: Closed helium cycle

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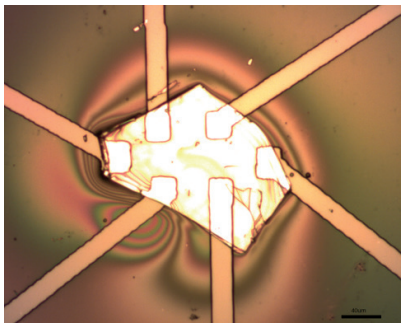
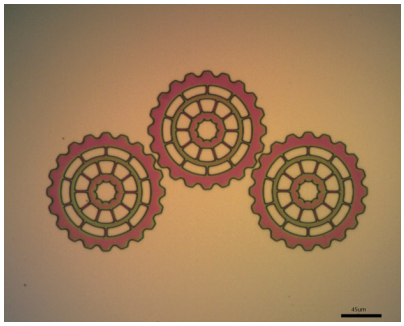
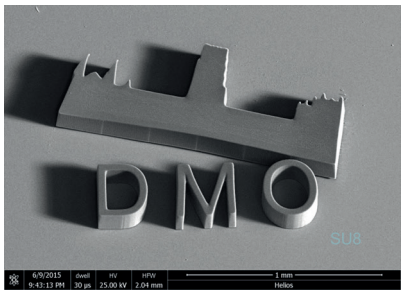
The new dual-wavelength MicroWriter – Optical nano/micro-photolithography for high demands

Our supplier DMO introduces the dual-wavelength option, a customized system aimed at lithography labs that work both with UV varnishes as well as with g-line and h-line coatings. Each of the four systems in the MicroWriter 3 family, i.e. Baby, Baby Plus, Mesa and the flagship, which is the MicroWriter 3 Pro, can now be equipped with two different wavelengths. Users can choose between photodiodes with 365 nm, 385 nm or 405 nm-wavelength. The corresponding wavelength for each writing process is simply selected via the software. No changes need to be made to the hardware.





In conjunction with the MicroWriter's multi-sample function, this is an extremely powerful approach designed to facilitate working with differing user demands. Thus, the MicroWriter can be equipped with a wide variety of samples and each individual sample can be assigned its own writing process.



This allows several time-consuming writing processes to be carried out fully automatically without any user interaction, e.g. over the weekend .

The dual-wavelength option can also be retrofitted as an upgrade for all MicroWriter models of the 3rd generation.

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Germany's first PPMS-16 is located in Dresden

Our coolest research system is surrounded by a beautiful baroque environment!

The first PPMS-16 in Germany

Since February 2021, the Leibniz Institute IFW in Dresden features a brand new Physical Property Management System PPMS-16. The PPMS-16 has a powerful superconducting magnet and can generate fields of up to 16 Tesla. For comparison: The magnetic field in Central Europe has approx. $5x10^{-7}$ Tesla, and the strongest solenoids produce fields in the range of 3 Tesla. In contrast to the widely used PPMS-9, only few PPMS-16 systems have been installed worldwide to date; most of them in China and the USA. We are proud that the IFW has bought the first PPMS-16 in Germany. The IFW uses the PPMS-16 for finding, exploring and understanding potential applications for new materials that exhibit magnetic phase transitions or magnetic interactions.

It will also help analyze materials whose properties make them respond in a special way to magnetic fields, such as superconductors or novel "quantum materials." For this purpose, magnetic measurements are performed, and electrical transport, thermal transport and thermodynamic properties are measured.

About the IFW

At the Leibniz Institute for Solid State and Materials Research (IFW) in Dresden, scientists and engineers work hand in hand. Together, they investigate the physical and chemical properties of materials that are considered for novel applications. Thus, at the IFW many different disciplines come together: experimental physics, theoretical solid state physics, chemistry, materials science and electrical engineering. The IFW is a legally independent, non-university research institute and a member of the Leibniz Association.

About the PPMS

Quantum Design's Physical Property Measurement System PPMS is a unique, open-architecture laboratory instrument with a variable temperature range for performing a variety of automated measurements. In terms of hardware and electronics, the available measurement options include everything that is needed to obtain meaningful and publishable data. The new PPMS enables the measurement of samples in strong magnetic fields and a temperature range of 1.9 - 400 K.

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Hyperspectral analyses – (Almost) as easy as a cell phone shot!

Our ultra-compact, all-in-one hyperspectral camera Specim IQ guides you accurately through the acquisition and evaluation of hyperspectral analyses. A special focus camera enables easy focusing, the camera itself suggests the exposure time, and evaluation algorithms are available in the camera for data analysis. Even without much experience in hyperspectral analysis, you will be able to collect and evaluate data immediately. An integrated cross-fade camera adapts the spectral information to the "visible" world, thus enabling fast visual matching.

Specim has posted a series of useful tutorial videos that show all kinds of tips and tricks for beginners and professionals alike to optimize recordings and further simplify the handling of the IQ:

https://www.specim.fi/iq/support/

If you have any questions on this or would like to test the camera yourself, please contact us. We will be happy to provide you with the IQ for a few days free of charge!

Please contact us
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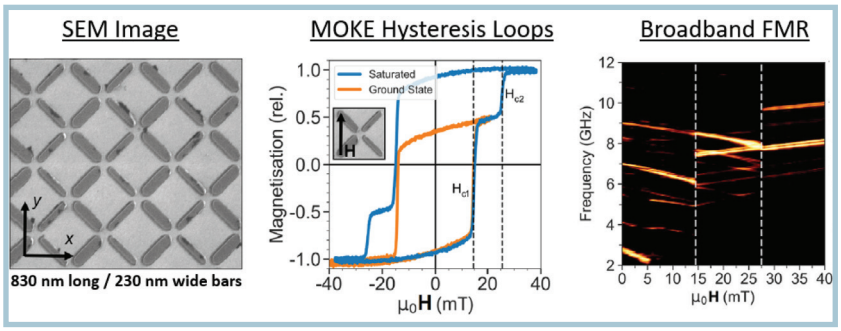
A comprehensive study of an artificial spin ice using CryoFMR and NanoMOKE

Researchers at the Imperial College London who work with magnonics have done comprehensive studies on artificial spin ice. To do this they used the CryoFMR and NanoMOKE from our partners NanOsc Instruments and Durham Magneto-Optics [1].



Magnonic materials are considered to use spin-waves to propagate and process information. Spin-waves offer a range of benefits as data carriers: Low heat generation, power consumption and coherent coupling to photons, phonons and other magnons. Applications are transistors, multiplexers, and logic gates. Ferromagnetic resonance spectra were measured using a NanOsc Instruments CryoFMR in a Quantum Design Physical Properties Measurement System.

MOKE-measurements were performed on a Durham Magneto-Optics NanoMOKE-system. The laser spot was approximately 20 μm in diameter.

Some examples are given in the pictures. SEM image (on the left) shows the sample structure. The longitudinal Kerr signal was normalized and is depicted in the middle. The linear background was subtracted from the saturated magnetization. The measured Kerr signal was averaged over 300 field loops to improve signal to noise. The FMR spectra (on the right) show the derivative output of the microwave signal as a function of field and frequency. The normalized differential spectra are displayed as false-color images with symmetric log color scale.

[1] , J.C., Vanstone, A., Dion, T. et al. Reconfigurable magnonic mode-hybridisation and spectral control in a bicomponent artificial spin ice. Nat Commun 12, 2488 (2021). https://doi.org/10.1038/s41467-021-22723-x

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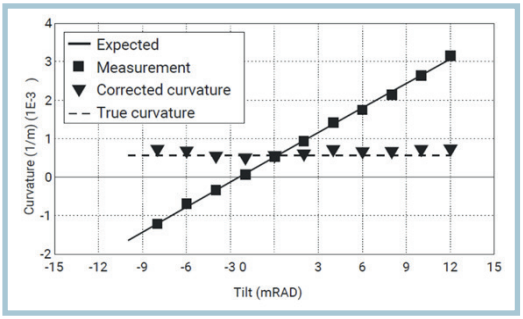
Toho stress tools offer improved algorithm to correct apparent reflection angle change

The optical cantilever beam technique utilizes a laser beam which is scanned across the sample substrate. The slope of the substrate surface is measured by monitoring the beam reflection angle along the scan direction. This algorithm corrects errors in the measured angles that are due to both sample tilt and curvature.

The algorithm also takes account of the fact that the apparent reflection angle is a function of the substrate surface height over the horizontal plane. Using this algorithm, the curvatures can be recalculated, and the corrected curvatures (triangles) can be plotted for comparison below.



Seeming and corrected curvatures of a flat specimen as a function of specimen inclination. The square points are the measured curvatures without correction, the triangles represent the corrected curvatures with the improved algorithm.

Apparent and corrected curvatures of a flat sample as a function of sample tilt The square points are the measured curvatures without correction, the triangles represent the corrected curvatures with the improved algorithm.

When measuring samples that are irregular, the Toho FLX Series can help measure thin film stress. The improved algorithm takes account of the fact that the apparent reflection angle is a function of the substrate surface height over the horizontal plane.

For further information, please follow this link

https://bit.ly/3kQr5Gt

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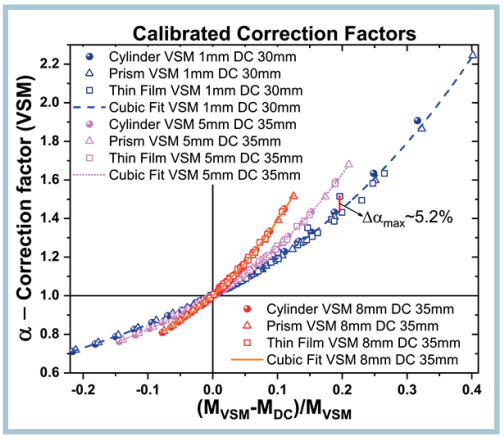
VSM measurements – Measuring magnetic moments independent of sample geometry

The most common method to determine the magnetic moment of a material is the vibrating sample magnetometer. When using this method, the sample vibrates in a gradiometer, usually with a magnetic field applied. The system measures the current induced in the gradiometer and on this basis calculates the magnetic dipole moment. Since the coupling between sample and gradiometer depends on the geometry of the sample, this calculation involves a geometry-dependent error, which is also influenced by the amplitude of the sample movement. The larger the sample is relative to the volume of the gradiometer, the larger the error. For some geometries, it may amount to 10% plus. Correcting this deviation is not an easy task, in particular if irregular sample geometries are concerned. But even with common shapes such as cylinders or cubes, this is not at all trivial, since not only the shape of the specimen itself, but also its radial offset from the centre of the gradiometer plays its part in this calculation.



Simulated correction factors as a function $x = (M_{VSM}-M_{DC})/M_{VSM}$ for three pairs of DC scan lengths and VSM amplitudes

The usual way to remove the geometry portion is to apply a correction factor. In Quantum Design's MPMS3 SQUID magnetometer, this can be calculated e.g. by the software, provided that the geometry (cylinder, cuboid, thin film), the dimensions and the radial offset are known. In practice, measuring these parameters, in particular the radial offset, is quite difficult.

The research group led by Prof. Amaral of the University of Aveiro in Portugal has recently published a method that allows magnetic measurements that do not depend on the geometry [1]. This method combines VSM with DC-scan measurements. The latter work similarly to a VSM. But in contrast to a VSM, in a DC-scan measurement the sample is simply pulled through the gradiometer once instead of making it vibrate with a sine wave. For each pair of VSM amplitude and DC-scan length, there is a defined correction function α(x), where x describes the ratio of the VSM measurement MVSM to the DC measurement M_{DC}: $x = (M_{VSM} - M_{DC})/M_{VSM}$. If both measurement values are known, it is easy to correct the magnetic-moment result. This so-called GICM (geometry-independent correction method) is independent of field strength, temperature, radial offset and geometry.

In the MPMS3, VSM and DC measurement can be performed consecutively without having to change the hardware.

[1] C O Amorim et al 2021 Meas. Sci. Technol. 32 105602

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NIR compact camera Bobcat 100 GigE in stock!

The Bobcat320 with its 320 x 256 pixel InGaAs detector and GigE interface is still our most popular all-round camera. The camera is stabilised with a thermoelectric cooler and has a frame rate of 100 full frames per second. Although very compactly built, the Bobcat impresses with a high-resolution image with high homogeneity thanks to the 20 µm pixels. The camera is easy to handle and easy to integrate into experimental set-ups.

In order to offer you short delivery times, we have stocked the Bobcat with 100 Hz and GigE interface, including Xeneth control and evaluation software. We have also reduced the price!

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Autonomous vehicles – Optical filters for LiDAR applications

LiDAR is a sensing method that detects objects and maps their distances by sending an optical pulse at 905 nm or 1550 nm to the target and measuring the reflected return signal. Since conventional LiDAR system architectures use dedicated transmit and receive apertures, the resulting package has a relatively large footprint. However, leveraging polarization techniques can miniaturize the size of the optical subsystem. In addition, LiDAR systems routinely utilize narrow-band pass filters in both the transmitted and receiving path to improve the system signal-to-noise ratio.

Andover Corporation's self-reliant manufacturing approach places us in the optimal position to quickly provide customized prototypes of polarizing beamsplitters with unique angular performance characteristics to meet your LiDAR needs. With our 15 coating chambers, we can offer coating solutions from the UV range down to 15 µm. We also provide in-house manufacturing for coating fixtures, customized mounts, cutting, coring, shaping and polishing for a vast array of substrate materials.

We provide standard bandpass filters that work with the common laser wavelengths used with most LiDAR systems, including 532 nm, 905 nm, 1064 nm, and 1550 nm.

This enables Andover Corporation to support both the development of new products and the production of optical sensors for the automotive industry. We offer customized engineering to provide superior and cost-effective solutions. Our extensive experience with image-quality bandpass filters, broadband AR coatings and polarizing beam splitters makes us an ideal partner for supplying the automotive industry with optical sensors. Our vertically integrated factory with in-house coating, manufacturing, optical assembly and testing capabilities can provide customized solutions at shorter lead-times.

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New service technician at QD

My name is Konstantin Voigt, since March 2020 I have been working as a service technician at Quantum Design in Darmstadt.

Before joining the Quantum Design service team, I studied physics and mathematics at the University of Leipzig. Afterwards, I completed my training as a physics lab technician at one of the world's leading manufacturers of tunable semiconductor diode lasers. During my apprenticeship, I was primarily concerned with the construction and fine adjustment of optical systems. I can transfer the knowledge I have acquired and deepened in this way to the installation and troubleshooting of your equipment, so that nothing stands in the way of your measurements.

Since my childhood I have been very tech-savvy and an enthusiastic model builder.

When getting away from the screen and artificial light, I enjoy being outdoors on my bike.

At Quantum Design, I oversee the MPMS3, PPMS and DynaCool units of our San Diego parent company. Since helium is a precious and very finite resource, capturing and recycling it becomes increasingly important. That's why Quantum Design offers scale. I will be happy to assist you with the design, installation and service of your individual system.

I look forward to meeting you in person when the opportunity arises.

Konstantin Voigt
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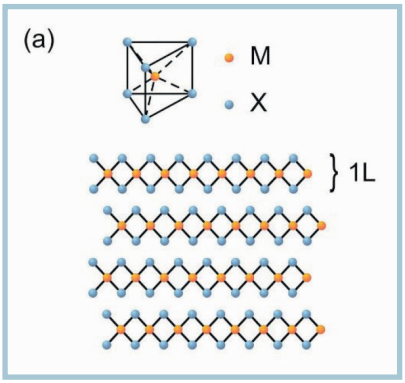
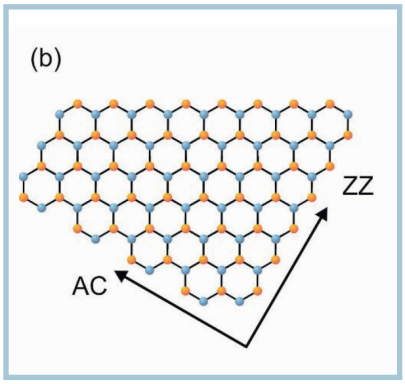
Relative orientation of 2D semiconductors

Researchers at TU Dortmund University have determined the relative orientation of atomic 2D semiconductors using "second harmonic generation". They used an Andor Technology spectrometer that consisted of a Kymera 328i spectrograph and an iDus 416 CCD detector.

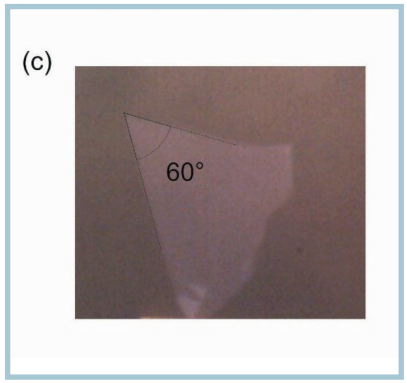


(a) Crystal structure of MX2-based transition metal dichalcogenides

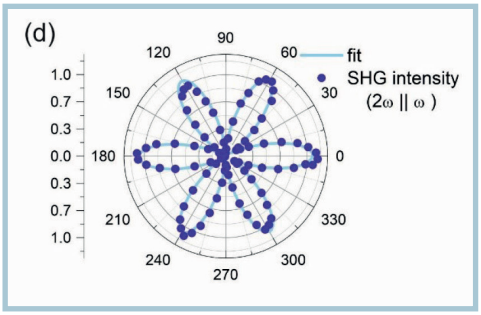


(b) Monolayer crystal form of the top side with "armchair" AC and "zigzag" (ZZ) direction

Two-dimensional atomically thin materials have been studied very intensively in the past decade. Crystals with a layered structure in which strongly bonded atomic layers are held together by weak van der Waals forces can be split into single layers by mechanical exfoliation. Transition metal dichalcogenides with the chemical formula MX2 consist of transition metals M of group IV, V or VI (e.g. Ti, V, Mo) and chalcogenide atoms X (S, Se, Te). Monolayers of these materials have unique properties that differ greatly from the corresponding bulk or multilayer form. Controlled stacking of individual layers of the same or different material makes it possible, e.g., to manipulate optical and electrical properties. However, stacking two monolayers with precise alignment of the crystallographic axes requires a method to measure their relative orientation. Although the crystals break along specific crystal axes, an optical image does not allow a distinction to be made between them. A detailed description of the experimental setup and results can be found on our website about "Low-noise CCD detectors" in the section "Reference customers" under the headline „Relative orientation of atomically thin 2D semiconductors“



(c) Optical image of a monolayer crystal with sharp edges. The angle of 60° indicates that both edges are either AC or ZZ



(d) Polarization resolved SHG TMD monolayer crystal lattices in the 2H phase belong to the trigonal-prismatic (D3h) point group

https://qd-europe.com/AP_atomically.pdf

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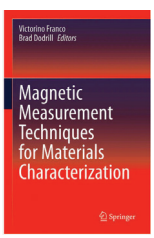
Tips and tricks – New book about magnetic measuring methods for material characterization



The book covers the most common methods for characterizing magnetic material properties and shows interesting application examples. Tom Hogan and Randy Dumas, application specialists at Quantum Design, co-authored the chapter: "Recent Advances in SQUID Magnetometry". It deals primarily with the SQUID-VSM method. In addition, the authors describe how remanent fields can be dealt with and how to improve measurement accuracy.

Other chapters are about vibrating-sample and torque magnetometry, the magneto-optical Kerr effect, first-order reversal curve (FORC) analysis and more.

The book is published by Springer-Verlag and available as eBook and hardcover (ISBN 978-3-030-70442-1).

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PPMS and M91 – More flexibility for the measurement of electrical properties and Hall effect

Insiders will probably think that electrical measurements in the PPMS/DynaCool are not at all new. And they do have a point, as electrical measurements have been around for a very long time as a standard option, and are one of the most popular options alongside magnetic measurements (VSM) at that. The entry-level variant is the "resistivity option" and spans a range from about 10 µΩ to about 5 MΩ and thus not only meets many requirements, but is also sometimes used to read out a thermometer. For more demanding measurements, Quantum Design offers the "ETO option". It is based on AC excitation (lock-in), and for two-point measurements enables resistances down to the lower gigaohm range to be determined.

A cooperation between Quantum Design and Lake Shore has now lead to the emergence of a third option for electrical measurements. With its M91 FastHall controller, Lake Shore offers a clever electronics optimized for Hall effect measurements, with the additional benefit that it can be easily adapted to fit into existing measurement setups. In contrast to the "Resistivity" and "ETO" measurement options, the M91 takes a different approach. It is not (not yet?) controlled via the PPMS/DynaCool software MultiVu, but via MeasureLink from Lake Shore. MeasureLink controls both the temperature and the magnetic field and performs the measurements. This means that you have to do without the convenience provided by MultiVu, but you gain flexibility, especially when measuring the Hall effect. This makes the M91 a great addition, not only to existing PPMS and DynaCool systems, but also as part of a new investment.

M91 FastHall Controller – Overview

- Resistance range: 10 mΩ to 10 MΩ, optionally up to 200 GΩ
- Hall mobility: 0.001 to 10^6 cm2/V s
- Voltage range (excitation): 10 mV to 10 V
  Resolution: up to 100 nV
- Current range (excitation): 1 µA to 100 mA (10 pA to 1 µA)
  Resolution: up to 10 pA
- Sample holder: Puck or special sample (currently in development)

PPMS/DynaCool – Overview

- Temperature range: 1.9 K to 400 K, optional down to 400 mK (He3) or 50 mK (DR)
- Installed magnet: 9 T, 12 T, 14 T or 16 T

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May I introduce myself?

My name is Simone Heck. Since October 2019, I have been in the marketing team of Quantum Design. You can contact me for everything to do with our journal Spectrum. This task was handed over to me by Marlene Fontane, who took a well-deserved retirement in July this year

Before joining Quantum Design, I worked for many years as a freelance graphic designer for various agencies and companies, while also supporting my own clients in the areas of print publications and web design.

With my family, I live near Darmstadt. When I'm not working — and time permitting — I like to read crime novels; design, sew and print all kinds of things, do sports now and then or just enjoy putting up my feet, since our three little boys keep us pretty busy.

Working on Spectrum gives me deep insights into complex processes and product innovations, and I very much appreciate the exchange with colleagues that this work involves. In addition to this activity, I support the team in the procurement of advertising materials or other design-related tasks and I write and design posts for social media.

If you have any questions around Spectrum, feel free to contact me.

Best regards,
Simone Heck

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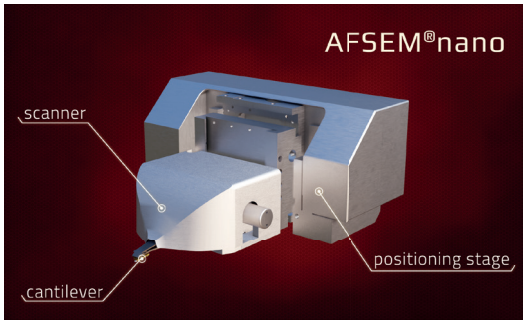
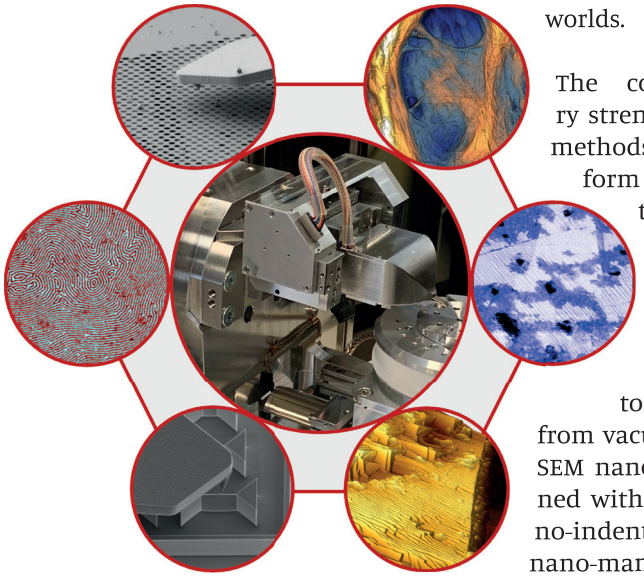
AFSEM nano – The world's most versatile in-situ AFM for correlated analyses in your SEM

AFSEM nano is the logical advancement of the innovative AFSEM concept. The newly developed measuring head is lighter, more compact and more powerful. It allows the easy integration into existing SEM or FIB systems. AFSEM combines two of the microscopy methods with the highest resolution - SEM and AFM, and thus provides completely new insights into the micro and nano worlds.





The complementary strengths of both methods enable users to perform in-situ characterizations of mechanical, electrical or magnetic properties of SEM samples with nanometer accuracy without needing to eject the sample from vacuum. In addition, AFSEM nano can also be combined with add-ons such as nano-indenters, tensile testers or nano-manipulators.

Thanks to its compact design, AFSEM nano can be integrated into almost all commercial SEM systems, thus expanding the possibilities for correlated analysis on a large variety of samples.

www.qd-europe.com

Please contact us
em@qd-europe.com

Ceres – Thermography by Xenics

With its Ceres series, Xenics offers a new uncooled thermographic camera for temperature measurements in the range of -20°C to 400°C.

Ceres is based on the Dione module developed by Xenics, and thus makes use of the state-of-the-art uncooled 12 µm microbolometer technology for high spatial resolution. The detector has 640 x 480 pixels with a NeDT of less than 60 mK. Despite its compact size of 45 mm x 45 mm x 75 mm, a mechanical shutter is built into the small camera for image optimization, even in warm-up phases. The camera weighs between 230 g and 378 g including optics. The onboard thermography system accommodated in the FPGA is optimized to prevent stray light errors and takes account of changing ambient temperatures and drift before image output. The data output is thus already temperature-calibrated, and there is no need for processing in a software.

With a very low latency of less than 100 µs, Ceres responds exceptionally quickly to temperature changes.

Ceres is available with GigE or CameraLink interface and various lenses.

Please contact us
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Quantum Design Microscopy – The new development team in Darmstadt for correlative microscopy in the nano world

Hello everyone — we are the new ones! Quantum Design Microscopy is a newly formed research and development group in Darmstadt, Germany. Our focus lies on the development of correlative microscopic methods.

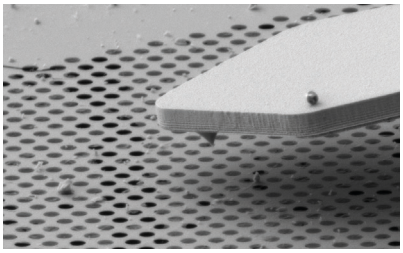
Everything started with GETec Microscopy in the beautiful city of Vienna in 2011. As a start-up company, GETec developed an in-situ atomic force microscope (AFSEM) for the easy integration in high-vacuum environments of scanning electron microscopes (SEM). This tool provides the complementary information gained by two of the most powerful microscopic methods and thus gives unique inisghts into the micro and nano worlds.

In 2018, GETec was acquired by Quantum Design, and in 2020, the Quantum Design Microscopy (QD-M) group was founded in Darmstadt.

The QD-M group is the first Quantum Design R&D group outside the company headquarters in San Diego. We have a fully equipped mechanics and electronics laboratory including state-of-the-art demonstration facilities.

Under the leadership of Chris Schwalb, we we work on exciting topics which arise from the field of correlative microscopy. This includes a broad scope of activities.

One focus is the realization of novel applications as well as applications for in-situ atomic force microscopy. We concentrate on the developments of new electric, magnetic and thermal measurement methods. In close contact with our customers and partners from industry and science, we implement current trends and demands.



In addition, we are in close collaboration with the San Diego development team to provide innovative and powerful solutions in the field of correlative microscopy to our customers. The applications cover a wide range from simple correlative topography measurements (e. g. the radius of razor blades) to the characterization of electric properties of semiconductor devices.

We would be happy to talk about the options and advantages of correlative SEM/AFM analysis for your application. Do not hesitate to contact us!

Our QD Microscpy team in Darmstadt:

Chris Schwalb is the team leader and responsible for the operating business.

Marion Wolff works with the global QD sales organizations.

Hajo Frerichs is responsible for new applications and customers' orders.

Lukas Stühn is our R&D specialist for the advancement of the AFSEM technology.

Sebastian Seibert is our R&D specialist for new correlative measurement methods.

Katharina Seehöfer is responsible for administration and order processing.

Miriam Wendel is our accounting and invoicing specialist.

Please visit our website and LinkedIn page for further information on us and our scope of activities in correlative microscopy. We look forward to getting in touch!

https://www.qd-microscopy.com

LinkedIn: https://bit.ly/3DkgIl0

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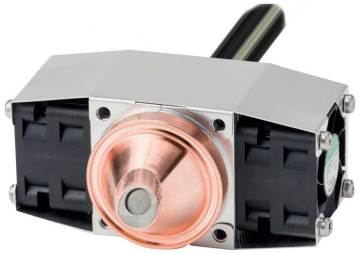
New high-power X-ray sources from Moxtek

The new Moxtek HPC150W 60 kV and HPC350W 75 kV X-ray tubes are designed to be used in XRF and imaging applications. Depending on the type, the tube voltage is 10 - 65 kV or 70 kV, tungsten and molybdenum are available as "targets".

The tubes are air-cooled, and the cooling (either 12 or 24 VDC) can be adapted to meet specific needs. The push/pull fan configuration makes it easy to direct the warm air outward. For XRF applications, the "cone" is designed for a vacuum seal at its base. The HPC tube incorporates radiation shielding.

On request, it comes with external high-voltage power supply.



HPC150W

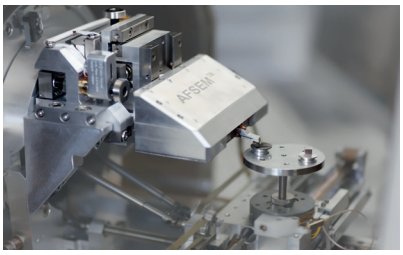
Typical applications

- High-power XRF - light elements
- Scrap metal sorting
- XRF thickness gauging
- Portable medical imaging
- Food inspection

Please contact us
imaging@qd-europe.com

Let's make more space in our lab – the AFM in SEM

Our development department for GETec's AFSEM, i.e. Quantum Design Microscopy, wants to create space in the new laboratory in Darmstadt, and for this reason offers its AFSEM 1.0 system for sale. The AFSEM 1.0 brings the two worlds of atomic-force and electron microscopy together and gives you a quick and easy first insight into correlative microscopy.



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em@qd-europe.com

Editor: Joachim Weiss, PhD

Please note that not all products are available in every country.