DYNAMIC FIELD CAMERA
MANAGE YOUR SCANNER’S FIELD DYNAMICS

SKOPE MAGNETIC RESONANCE TECHNOLOGIES AG
“Having worked with prototype field cameras, I am impressed by the robustness, reliability and ease of use of the Dynamic Field Camera. Together with the Acquisition System it becomes a flexible tool for field measurements, which can readily be integrated into standard scanner sequences.”

Johanna Vannesjo, PhD
Post-Doctoral Researcher
University of Oxford, UK
THE OSCilloscope FOR MRI

Make your MR imaging fast, robust and accurate. Eliminate image artifacts with quick and easy k-trajectory measurements, including higher-order field perturbations.

SPEED UP YOUR METHODS DEVELOPMENT

- Effortlessly measure the actual magnetic field dynamics
- Detect eddy currents, delays, field drifts, and oscillations without the need to average
- Efficiently analyze sequences on the immediately visualized field evolution

LEVERAGE YOUR HARDWARE BY ADVANCED SYSTEM CHARACTERIZATION

- Measure the impulse response of your gradient and shim systems
- Correct perturbations, including field oscillations and eddy currents
- Improve image quality based on actually measured k-trajectories

PERFORM YOUR QUALITY ASSURANCE AT GRADIENT SYSTEM LEVEL

- Boost the consistency of your MR studies
- Gain insight into the variability of the encoding process
- Detect system deterioration at an early stage

System characterization (GIRF) used to reconstruct single-shot variable density EPI and spiral images.
EXAMINE THE FIELD DYNAMICS ACTUAL REALIZATION

Programming an MR sequence is one thing, but seeing how the scanner actually realizes the sequence is a whole new ball game. Using the Dynamic Field Camera allows you to know and optimally compose your MR sequence. MR application refinement is often hampered by the lack of knowledge of the dynamic magnetic field evolution. With Skope’s Dynamic Field Camera, you are able to remove the stumbling blocks on your way to the perfect MR image.

Determine field infidelities such as
- by eddy currents’ induced fields
- gradient delay
- field drifts
- concomitant fields
- shim settling

DECREASE YOUR TIME TO PUBLICATION BY KNOWING YOUR SEQUENCE.
In magnetic resonance signal encoding, extreme precision is required when generating gradient fields of considerable bandwidth and strength. This is challenging to accomplish, even with modern MR systems. The Dynamic Field Camera enables you to efficiently determine the complex dynamic models of gradient or shim behavior. This allows you to correct hardware imperfections to optimize your scanner performance.

A case in point for such an advanced calibration is quantitative phase contrast measurements, suffering from significant phase offset errors. Based on a system characterization, these field imperfections can be quantified with microsecond temporal resolution and corrected at the calibration or image reconstruction stage.

**GET THE MOST OUT OF YOUR SCANNER BY ADVANCED SYSTEM CHARACTERIZATION.**
MR scanner stability over minutes, hours, days and weeks is vital for the quantitative comparison of different scans or data acquired over multiple scan sessions. Be it in the long-term monitoring of a subject or a research study on a cohort.

System stability is typically monitored by periodically acquiring images of a phantom and comparing them. However, by observing the repercussions of changes in the dynamic field in the images, rather than the dynamic field itself, valuable information may be hidden or even lost. With the Dynamic Field Camera you can directly measure and assess the underlying encoding mechanisms responsible for fluctuations in your MR system.

BOOST THE CONSISTENCY OF YOUR MR STUDIES BY KNOWING YOUR SYSTEMS STABILITY.
FURTHER READING

- Analysis of temperature dependence of background phase errors in phase-contrast cardiovascular magnetic resonance. JCMR, 2014

SKOPE CUSTOMERS

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ACQUISITION SYSTEM

The Dynamic Field Camera signals are acquired by the 16-channel Skope Acquisition System and processed to provide field dynamics. Apart from scan planning, the user interface allows for easy visualization of gradient dynamics and k-trajectories.
Want to learn how to use the Dynamic Field Camera?
Watch the video and get in touch www.skope.swiss