

TECHNICAL ARTICLES VOL. 01

This collection of technical articles by ASG Superconductors from 2018 provides a vivid illustration of the often complex activities of a company in the high technology sector, made possible thanks to the skill and enthusiasm of all the people who every day contribute with their work.

Superconductivity was discovered in 1911, but the technology and applications linked to it are still "young": recent achievements include the discovery of the Higgs Boson, the development and refinement of MRI magnetic resonance imaging and major steps forward in hadron therapy. Our current activities promise to bring us closer to harnessing nuclear fusion, providing a radical new and inexhaustible source of energy for the planet.

We can expect many further innovations to arise from the application of superconducting technology, which we hope to be able to relate in future volumes of this collection.



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A very special "thank you" to the authors and to all ASG's people.
Your everyday work at the technological frontier is paving the way
to the future of research, energy and med-tech applications.

THE BEST MRI EXPERIENCE

The MROpen EVO is the world's only superconducting, cryogen-free MRI system, offering high quality imaging, a small carbon footprint and all of the functionality of a truly positional MRI system.

The MROpen EVO contains upgrades such as a digital spectrometer, new graphic user interface, faster scans, new coils and re-designed sequences among other features.

MROPEN EVO THE BEST MRI EXPERIENCE THE NEXT GENERATION IN POSITIONAL MR IMAGING

Heather Mason



The MROpen EVO system is the next generation in positional MR imaging. The MROpen EVO is the world's only superconducting, cryogen-free MRI system, offering high quality imaging, a small carbon footprint and all of the functionality of a truly positional MRI system.

The MROpen EVO contains upgrades such as a digital spectrometer, new graphic user interface, faster scans, new coils and re-designed sequences among other features. The wide open design of the MROpen EVO is extremely patient friendly, greatly reducing claustrophobia and offering the patient high quality diagnostic images in a comfortable scanning environment.

The MROpen EVO has an entirely new graphic interface that is more user friendly and offers many more parameter choices than the first generation MROpen. The new parameter selections such as percentage of phase oversampling, image filtering, number of echos, echo spacing, zero filter, partial Fourier, and more allow the user to customize their scan sequence to balance high-quality images with faster scan times as compared to our first-generation system.

I was a technologist for nearly 4 years on the first-generation MROpen prior to joining the team at ASG and while the image quality is very good on that system, the new MROpen EVO images reflect increased spatial resolution, reduced scan times compared to the original MROpen. The digital spectrometer and re-designed sequences along with a new reconstruction algorithm are 3 additional noteworthy features.

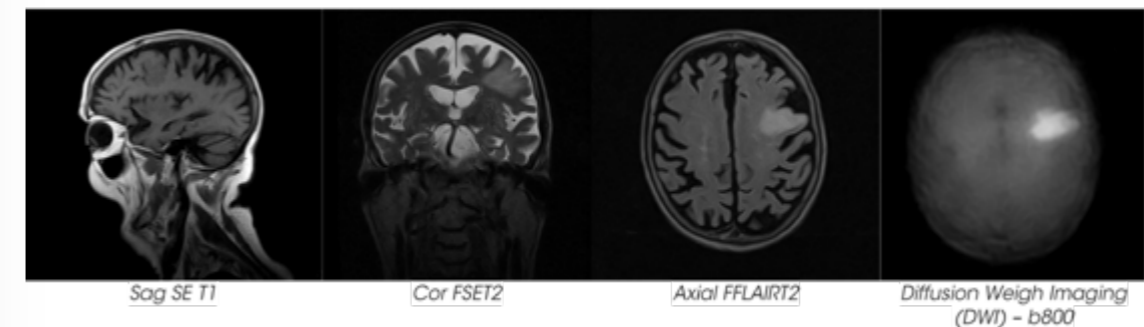


One of the challenges of using a positional, mid-field MR system such as the 0.5T MROpen is scan time. The newly designed MROpen EVO optimizes that challenge by producing faster scans as described earlier and by offering a new head and neck coil for improved neurological imaging, and a long spine coil that allows the entire spine to be imaged without taking the patient off of the table and changing coils. The patient can stay on the coil and the table can be re-centered for the anatomy of choice, and a larger effective field of view allows the user to obtain spinal images that cover the cervical spine and most of the upper to mid-thoracic spine or the lumbar spine and most of the lower to mid-thoracic spine.

This large field of view can accommodate a variety of pathologies that may extend beyond the traditional field of view such as syringomyelia, metastatic disease, scoliosis, multiple sclerosis and more. The head and neck coil (pictured above) is capable of covering both the head and neck and is optimized for angiographic exams of these areas without the need for the technologist to take extra time to change coils.

The new head and neck coil can be used with all of the routine and special imaging sequences that the MROpen EVO offers including DWI, MRA and 3D imaging.

The MROpen EVO also offers in-console post processing for MRA exams, allowing the technologist to produce Maximum Intensity Projection (MIP) cut outs of the vessels and reconstruct them in the traditional tumble and turn directions for evaluation.



Example of patient female -95yy with acute cerebral ischemia

The MROpen EVO also offers a positioning device to assist with shoulder exams which places the patient and coil in the appropriate position for image optimization so that both the patient and the coil are stabilized which reduces motion artifact and breathing motion in addition to streamlining the process of positioning the patient and coil at isocenter and improving patient comfort.

The upright/weight-bearing tools that are also available, speed up the positioning process for weight-bearing examinations in addition to increasing patient safety by stabilizing the patient in the weight bearing position. The result is an overall reduction of motion artifact and an increase in patient comfort in the weight-bearing position, ultimately improving the overall outcome.

The MROpen EVO brings to MRI state of the art positional imaging capabilities, with the head and neck coil, the long spine coil, a new graphic user interface, digital spectrometer, redesigned sequences and the shoulder positioner and weight-bearing tools, which in concert offer unparalleled patient safety, comfort and success. The MROpen EVO from ASG Paramed MRI unit truly is the next generation in positional MR imaging.



