



Accelerated MRI Scanning Using Spectral Sensitivity

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WARF: P120310US01

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method for faster, high-quality magnetic resonance imaging of metallic objects.

Overview

Magnetic resonance imaging (MRI) of metallic implants can be challenging because metal and surrounding tissue impact the main magnetic field differently. Such magnetic field inhomogeneities cause off-resonance effects which distort images.

Methods like MAVRIC (multi-acquisition variable-resonance image combination) try to improve the diagnostic quality of images by mitigating off-resonance artifacts. MAVRIC uses multiple acquisitions with different radio frequency (RF) pulses to cover the wide range of frequencies found near metal. Each acquisition produces images with a unique spectral sensitivity pattern, and these can be combined to form a composite image with signals from all the frequencies. But this process requires lengthy scan times and degrades the signal-to-noise ratio.

The Invention

UW–Madison researchers have developed an MRI method to accelerate data acquisitions in the presence of severe off-resonances, such as those induced by metallic objects.

After an imaging machine acquires k-space data, the method is used to derive spectral sensitivity information. This information—in the form of spectral images or sensitivity maps—relates specific resonance frequencies to distinct spatial locations in the magnetic field. This can be done because the off-resonance produced by metal implants and other foreign objects depends on factors like the size, shape and position of the object. The data can be spatially encoded to reconstruct an image.

Applications

- Clinical MRI
- Off-resonance, parallel and spectroscopic imaging

Key Benefits

- Faster scans
- Reduced image artifacts
- Improved efficiency and signal-to-noise performance
- Method does not require multiple RF coils.

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Additional Information

For More Information About the Inventors

- [Scott Reeder](#)

Related Technologies

- [See WARF reference number P120191US01 for information about improving 3-D MRI near metal using a spectrally resolved system free of frequency encoding distortions.](#)

Tech Fields

- [Medical Imaging : MRI](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846

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