

Uniform Saturation in Magnetic Resonance

USC Case #09-164, 3735

Market Opportunity:

Magnetic resonance imaging (MRI) is an advanced and commonly used clinical imaging technique, but has limitations to fully capture and consistently scan a subject. An MRI places the tissue being imaged in a magnetic field, causing atoms to resonate and create an image. A fully saturated image is one that has been maximally magnetized. Due to constraints from radiofrequency heating, a side effect of using high-frequency electrical fields during MRI scanning, the image outputted often does not reflect the full resolution of the object being imaged – it is not saturated uniformly. Still, MRI is an incredibly valuable technique, and the MRI market is projected to reach \$7.2 billion by 2021. The challenge of having uniform saturation in creating accurate images from MRI scanning is critical to the success of this industry, so there is a need to improve existing MRI techniques.

USC Solution:

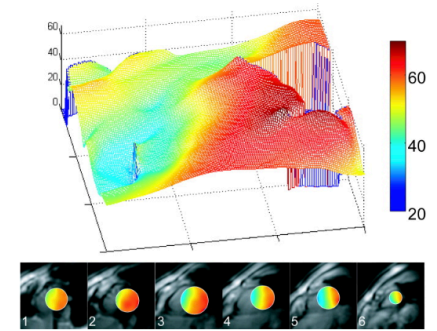
USC researchers have developed a tailored imaging technique which optimizes the magnetization of the target tissue. The use of this technique can mitigate the constraints of the MRI and minimize the inhomogeneities previously found in the image captured. A more saturated image of the area of interest is achieved with this technology.

Value Proposition

- Reduces risk of having to retake image
- Increases diagnosis accuracy

Keywords:

Longitudinal magnetization, magnetic resonance imaging (MRI), saturation, radiofrequency pulses, neuroimaging, cardiovascular imaging, musculoskeletal imaging, abdominal imaging



Applications

- Magnetic resonance imaging (MRI)

Stage of Development

- Experimentally validated
- Available for exclusive and non-exclusive license

Intellectual Property

Status:

Utility Patent Granted

[US 8,324,898](#), [US 7,372,270](#)

Key Publications:

[Design and use of tailored hard-pulse trains for uniformed saturation of myocardium at 3 tesla, Magnetic Resonance in Medicine 2008](#)

[Measurement and characterization of RF nonuniformity over the heart at 3T using body coil transmission, Journal of Magnetic Resonance Imaging 2008](#)

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