UNIVERSITY OF MINNESOTA
Driven to Discover℠

Improved Nuclear Magnetic Resonance Spectroscopy Using Half-Spin Echo Data Recovery

IP Status: Issued US Patent; **Application #:** 10/067,180

Half Spin Echo Data and Iterative Numerical Method Improves NMR Spectroscopy

Nuclear magnetic resonance (NMR) spectroscopic quality can be improved by acquiring more half spin echo data and using an iterative numerical method to reconstruct missing data points of the corresponding full symmetrical echo data. This method avoids the degrading effects of noise and provides higher-quality NMR spectrum with sharper peaks. The baseline of this technique is also improved which allows more resonance peaks to emerge from the region close to the water peak which allows chemical functional groups to be easily distinguished from water. The half spin-echo data technique is particularly advantageous at higher magnetic fields.

MN-IP Try and Buy

Try

- 18 months non-exclusive patent software license
- $15,000 Trial Fee waived for MN companies
- Patent expenses deferred during trial

Buy

- $30,000 Conversion Payment (includes all patent expenses)
- Royalty: $1500/unit for new NMR installation; $1000/unit for NMR system upgrade
- Royalty discount for MN companies
- Royalty holiday on 1st $1M in sales

Poor Spectral Resolution

Current NMR spectroscopy uses half spin-echo data which produces poor spectral resolution and a low signal to noise ratio, which limits sensitivity and specificity and makes it harder to analyze chemical compounds. Half spin echos occur when a secondary refocusing radio frequency (RF) pulse is applied to a relaxed magnetic moment.

FEATURES/BENEFITS OF IMPROVED NMR SPECTROSCOPY USING HALF SPIN ECHO DATA:

- Improved specificity and sensitivity by reducing the impact of noise on the NMR spectrum obtained
- Improved baseline allows more resonance peaks to emerge from the region close to the water peak
- High-resolution at high magnetic fields

Technology ID

z00135

Category

Engineering & Physical Sciences/Instrumentation, Sensors & Controls
Engineering & Physical Sciences/MRI & Spectroscopy
Life Sciences/Diagnostics & Imaging
Life Sciences/MRI & Spectroscopy
Software & IT/Algorithms

Learn more

Researchers: Kamil Ugurbil, PhD, Department of Radiology, Neurosciences and Medicine, Director of the Center for Magnetic Resonance Research. Dr. Ugurbil's research interests at the Center for Magnetic Resonance Research include development of ultrahigh field magnetic resonance methodology for MR imaging and spectroscopy, mechanisms of coupling of MR detectable signals to brain activity, and oxidative-metabolism in the brain and neurochemistry.