



Simultaneous RF Transmit and Receive in MRI Coils (20120123, Dr. Tommy Vaughan)

IP Status: Issued US Patent; **Application #:** 13/407,751

MRI Net Received Signal

A magnetic resonance imaging (MRI) method and apparatus can receive radio frequency (RF) signals while simultaneously transmitting a signal of like frequency. The MRI and spectroscopy technology removes artifacts of the transmitted excitation signal (Tx) from the received signal (Rx), leaving only the desired net received signal (NRx) to generate an image from the MR response of the person or object being measured. Its components are compatible with and function in high fields (such as a magnetic field of one tesla or more, or even ten tesla or more and/or an electric field of many thousands of volts per meter).

RF Signals Simultaneously Transmitted and Received

In conventional MRI/MRS machines, the excitation RF signal is a pulsed RF signal transmitted before—and not overlapped with—the receive signal. The received RF signal of interest is extremely small compared to the transmit signal, and the receive pre-amplifiers (preamps) would be overloaded or damaged if coupled to the receive antenna simultaneously with the excitation RF pulse being transmitted. This technology allows RF signals to be transmitted and received simultaneously.

BENEFITS AND FEATURES:

- Simultaneously transmits and receives RF signals from MRI coils
- Removing transmitted signal (Tx) artifacts from received signal (Rx) leaves desired net received signal (NRx)
- Compatible with high magnetic fields and/or electric fields of thousands of volts per meter

APPLICATIONS:

- High magnetic fields
- Magnetic resonance imaging (MRI)
- Spectroscopy machines

Phase of Development - Prototype development

Researchers

Tommy Vaughan, PhD

Professor, Biomedical Engineering, Columbia University

Technology ID

20120123

Category

Engineering & Physical Sciences/Instrumentation, Sensors & Controls
Engineering & Physical Sciences/MRI & Spectroscopy
Life Sciences/Diagnostics & Imaging
Life Sciences/Medical Devices
Life Sciences/MRI & Spectroscopy
Agriculture & Veterinary/Veterinary Medicine

Learn more



Interested in Licensing?

The University relies on industry partners to scale up technologies to large enough production capacity for commercial purposes. The license is available for this technology and would be for the sale, manufacture or use of products claimed by the issued patents. Please contact us to share your business needs and technical interest in this MRI signals technology and if you are interested in licensing the technology for further research and development.

Explore other available products at [Technology Commercialization](#)