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Simultaneous Multi-slice Non-water Suppressed Magnetic Resonance Spectroscopic Imaging Method for Metabolic Imaging

A novel method for Magnetic Resonance Spectroscopic Imaging (MRSI) significantly accelerates data acquisition while suppressing artifacts, improving the speed and quality of neurochemical profiling for clinical and research use.

Magnetic resonance spectroscopy (MRS) is a quantitative technique that allows neurochemicals to be accurately assayed in vivo in humans. MRS can be used to characterize the progression of neurodegenerative disease, conduct non-invasive biopsies to distinguish between types of tumors, and address fundamental neuroscience questions. An extension of single-voxel (SV) MRS is magnetic resonance spectroscopic imaging (MRSI), which allows neurochemical profiles to be acquired from multiple voxels simultaneously over substantial regions of the brain. By acquiring multiple voxels simultaneously, MRSI has relatively long acquisition times, side lobe artifacts, eddy-current-induced artifacts, and tracking B0 drifts due to subject motion or thermal fluctuation. Addressing these issues could result in increased use of this technique in both clinical and research settings.

Researchers at Purdue University have developed a novel method for generating MSRI images that alleviates the long acquisition time. It is better and different than existing solutions. The method significantly accelerates the acquisition, but also suppresses the sidelobe artifacts and increases the signal-to-nose ratio compared to existing solutions. The method enables correction of gradient-induced sideband modulations, eddy-current-induced artifacts, and tracking B0 drifts.

Advantages:

-Accelerates the acquisition

-Suppresses sidelobe artifacts

-Correction of gradient-induced sideband modulations

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Category
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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Potential Applications:

-Magnetic Resonance Spectroscopic Imaging

-Concentric Ring Trajectory

TRL: 3

Intellectual Property:

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