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Enhanced Resolution Cardiac MRI

Combines outer volume suppression (OVS) and accelerated imaging

This technology is an MRI (magnetic resonance imaging) pulse sequence for cardiac imaging which enables an increased number of slices across the heart volume per heart beat resulting in enhanced temporal and spatial resolution. The method may result in a decrease in overall scan time. The novel method combines outer volume suppression (OVS) and accelerated imaging, such as simultaneous multi-slice (SMS)/compressed sensing (CS), without introducing fold-over artifacts.

Scans more slices per heartbeat, reduces imaging time

Cardiac MRI is often slow and is typically limited to only three slices across the heart per heartbeat. In addition, 3D high resolution cardiac imaging sequences can take up to 10 minutes. Current OVS techniques do not usually allow for a reduction of the FOV, as the residual signal creates fold-over artifacts. This novel method enables increased acceleration rates and reduces fold-over artifacts. Combining OVS with SMS and CS accelerates scan time, particularly for body imaging and improves temporal and spatial resolution.

Multi-band myocardial perfusion imaging

A novel imaging sequence uses the CAIPIRINHA method for multi-band (MB) imaging to allow myocardial perfusion imaging. This method adds an outer-volume suppression module to reduce signals from the chest and back while the heart is imaged. Multi-band imaging may increase the coverage significantly, and adding the OVS module may enable faster multi-band imaging rates.

Phase of Development

- Prototype developed. Initial evaluations with a small number of healthy subjects.

Benefits

- Enables faster acceleration rates
- Increases number of achievable slices across the heart volume per heartbeat
- Improves temporal and spatial resolution
- Reduces scan time, particularly for body imaging
- Reduces fold-over artifacts

Features

- Combines outer volume suppression (OVS) and accelerated imaging, e.g., simultaneous multi-slice (SMS)/compressed sensing (CS)
- Multi-band myocardial perfusion imaging
- CAIPIRINHA method for multi-band imaging
- Outer-volume suppression module

Applications

Technology ID

20170286-20170315

Category

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

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- Magnetic resonance imaging (MRI)
- Cardiac imaging
- MRI pulse sequences

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