Radiology Power Pitch Session

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Multi-echo Simultaneous Multi-slice (MESMS) Protocol

Automatically identifies non-BOLD artifactual components

Multiband factor of 3
3 echoes (14, 32, 51 ms)
Whole brain coverage
TR = 0.87 s

Enables fully automated denoising of fMRI time series

Offers 80% improvement over conventional TR scans in ability to detect BOLD-like components

Higher temporal resolution enables automated identification of network sub-components

Credit: Olafsson, Kundu et al, In preparation
MESMS vs. Traditional EPI

Slice Levels in “Native” Space (mm)

56
36
16
-18

Percent Signal

≥ 1.0
0.5
> 0.0

Multiecho (MESMS)
Threshold p < .0001

Standard EPI
Threshold p < .05

56 mm
42 mm
36 mm
16 mm
-18 mm

Courtesy of Frank Haist at UCSD
Resting-State BOLD Connectivity

Task-Related Motor Activation Map

Resting State Correlation Map

Resting State fMRI Signals From Left and Right Motor Cortices
Multimodal Imaging (fMRI/EEG/MEG)

Pattern of low EEG vigilance

Pattern of high EEG vigilance
Global fMRI Signal and EEG Vigilance

Caffeine session pre-dose (blue), control session pre-dose (red) /post-dose sections (green)

EEG spectra for three representative subjects.

Wong et al 2013