

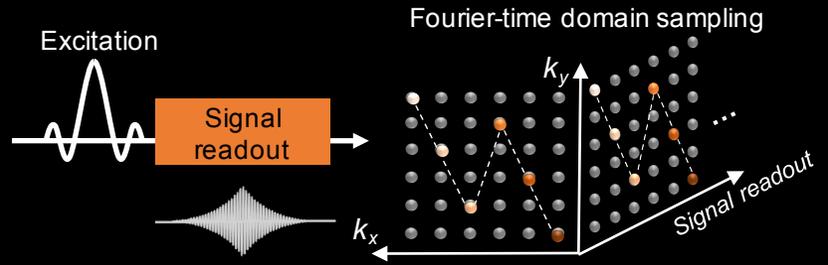
Purpose

- To overcome the challenge of quantitative MRI — slow acquisition speed (scan time > 1 hour) by developing a new MRI technique that is able to provide > 10 times higher efficiency

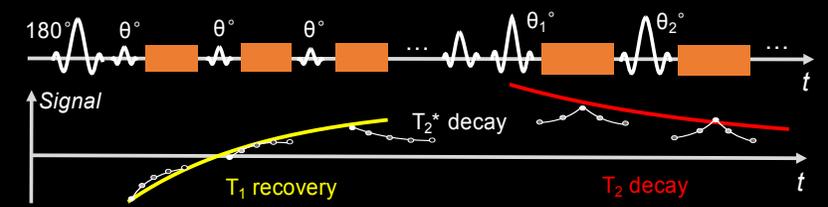
Method

I. Signal sampling: efficient encoding in Fourier-time domain

- Spatial correlation: multi-channel receiver coil arrays
- Temporal correlation: across signal readout

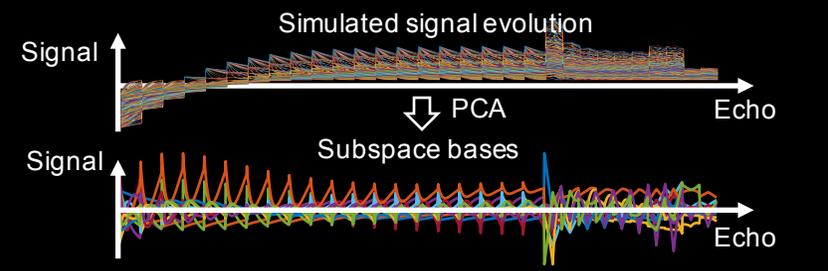


II. Signal generation: sensitive to quantitative parameters



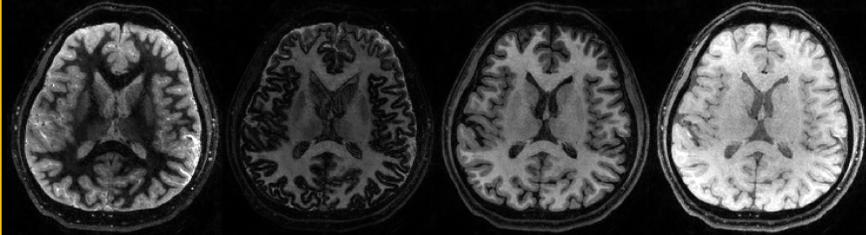
III. Subspace reconstruction: time-resolves >1000s of images

- Use prior information of signal evolution

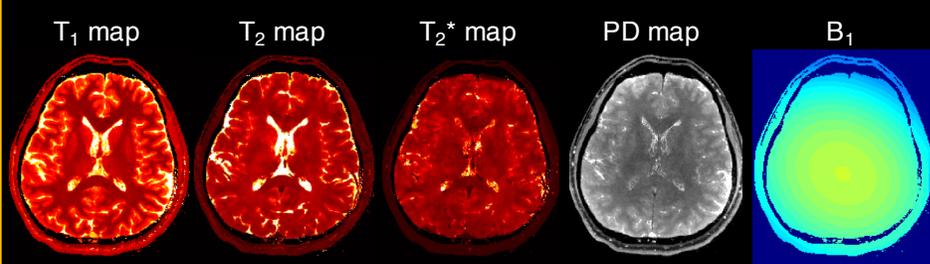


Results Part I. Order of magnitude faster scan: 3-minute scan at 1-mm isotropic resolution

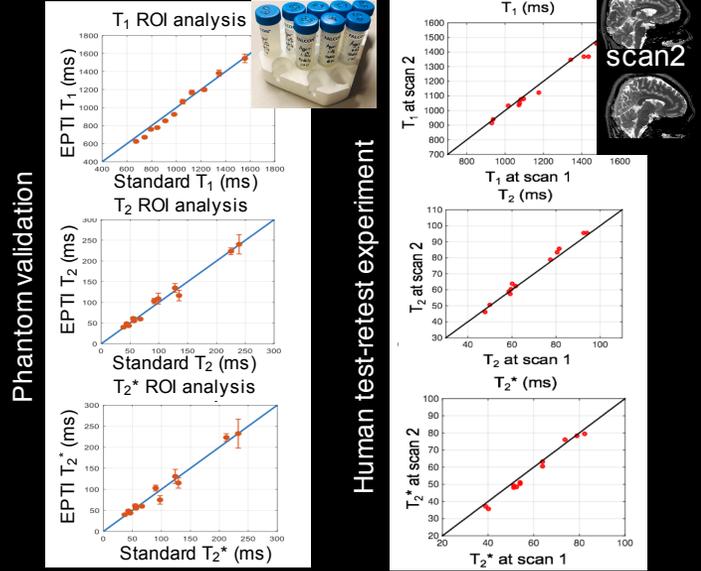
I. Thousands of multi-contrast images at <1 ms temporal increments



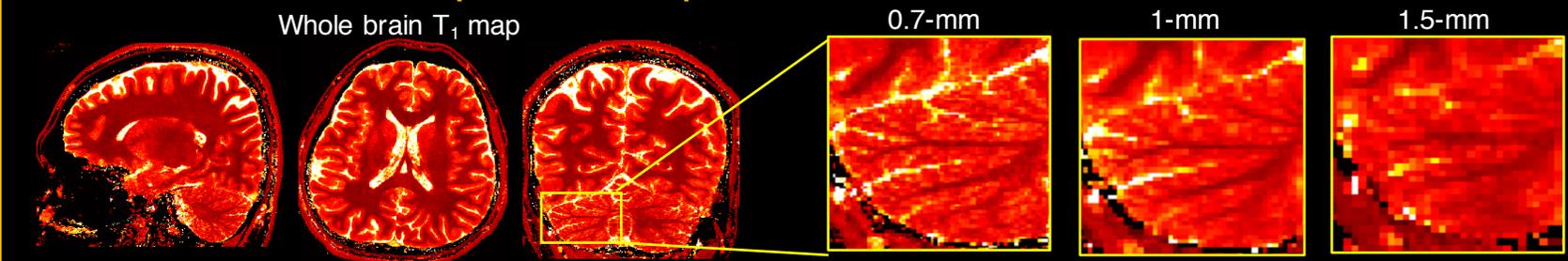
II. Simultaneous multi-parametric mapping with whole brain coverage



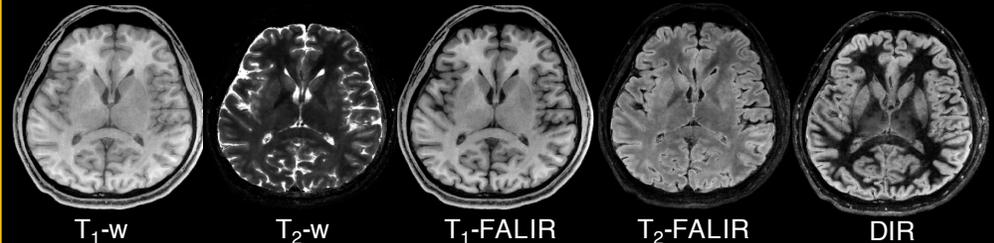
III. Reliable measurements & repeatability



Results Part II. Sub-millimeter qMRI reveals exquisite details from a 9-minute scan at 700 um resolution



Synthesized clinical contrasts using the acquired quantitative maps



Summary

A new MRI technique that is able to provide >10 times higher efficiency with high accuracy and quality.

Reference

- Wang et al., MRM 2019; 2. Dong et al., MRM 2020;
- Wang et al., ISMRM 2020; 4. Wang et al., ISMRM 2019;
- Liang ZP, ISBI IEEE 2007; 6. Tamir JI et al., MRM 2017;