

Mechanical Tilt-Induced Gradient Fields for Low-Field Spokes-and-Hub Permanent Magnet MR Imagers

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Declaration of Financial Interests or Relationships

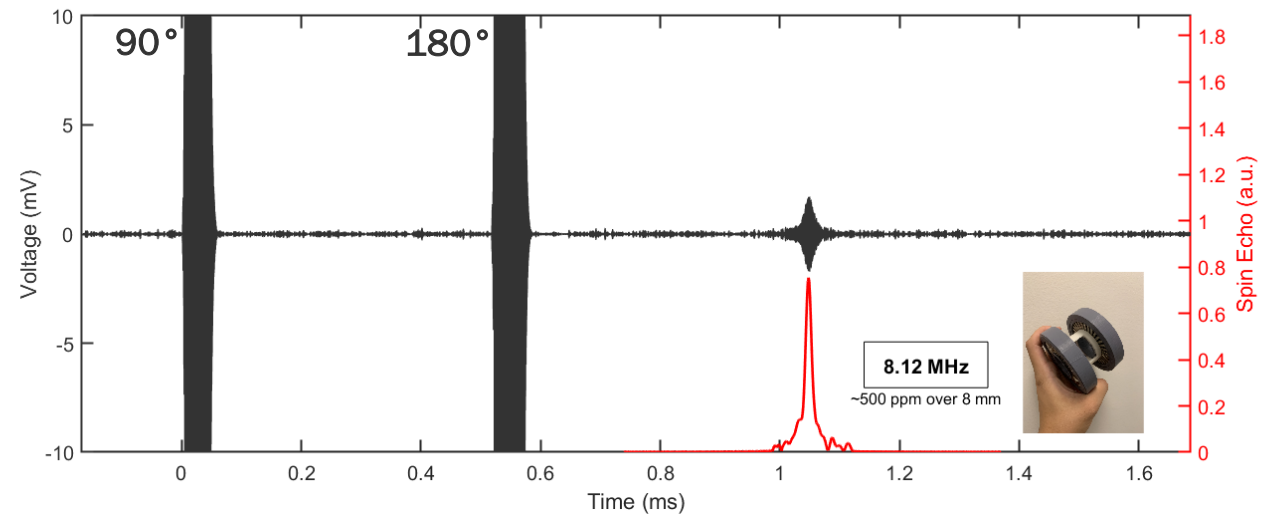
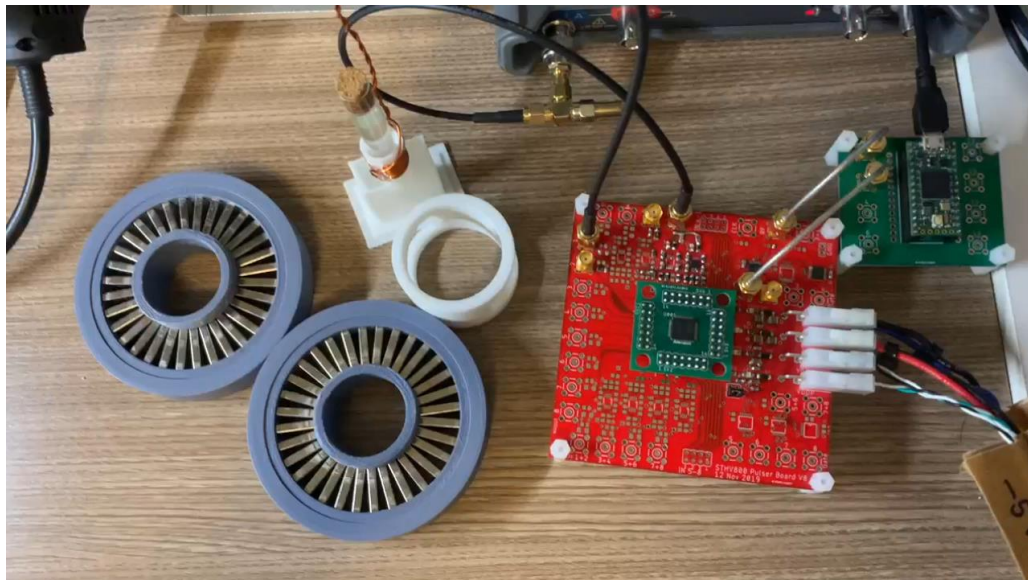
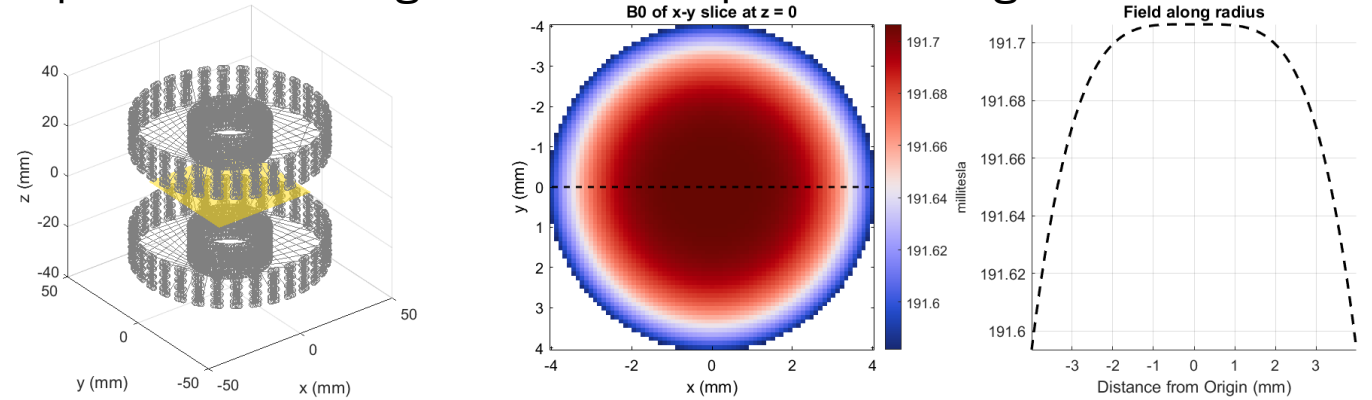
Speaker Name: Irene Kuang

I have no financial interests or relationships to disclose with regard to the subject matter of this presentation.



“Spokes-and-Hub” magnet arrays

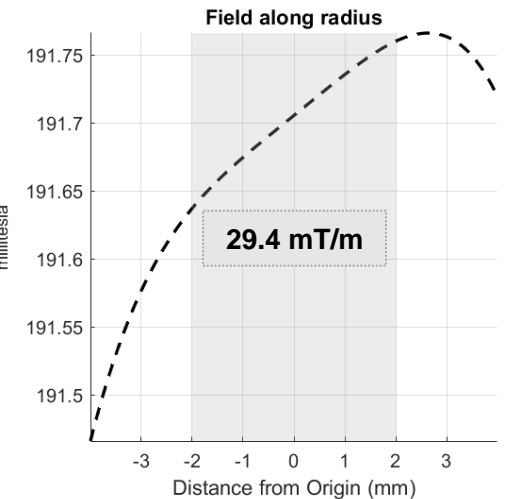
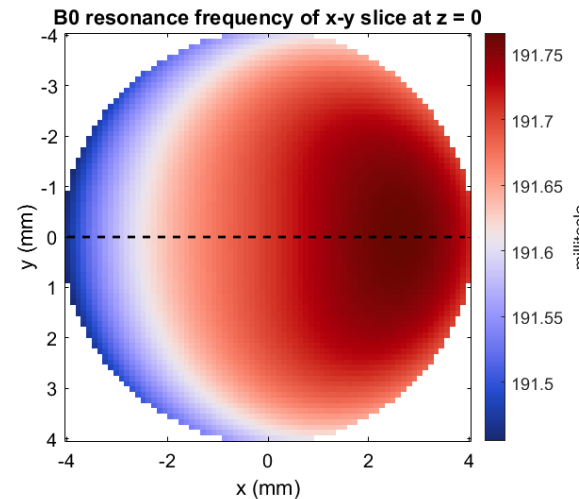
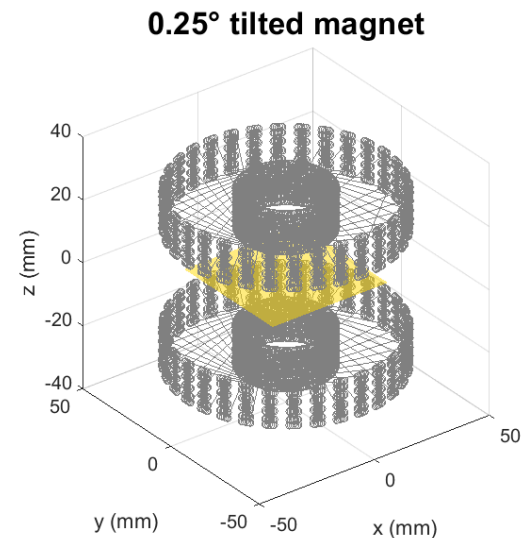
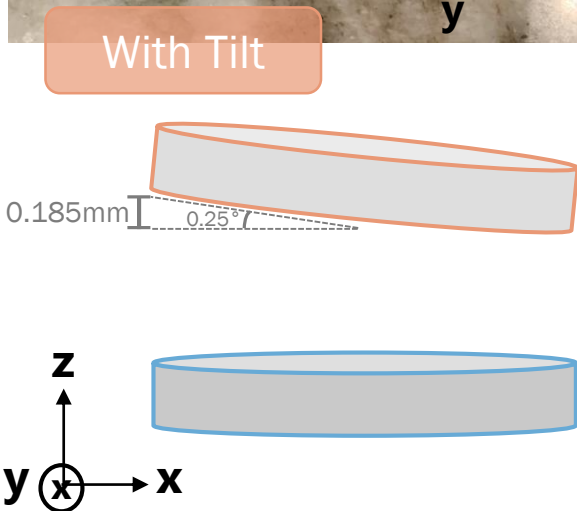
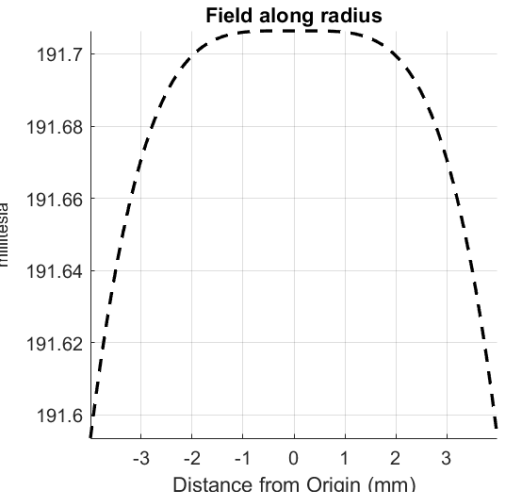
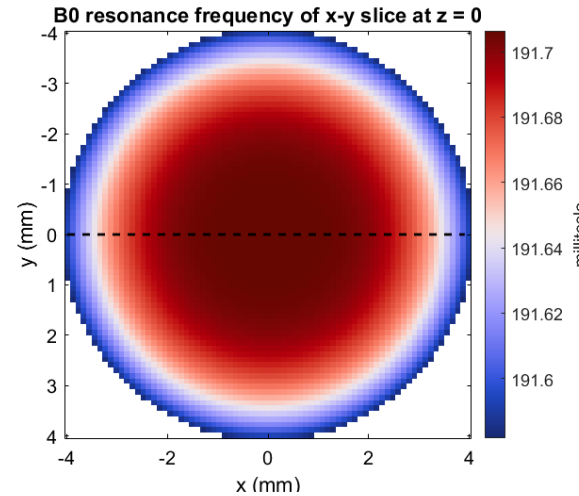
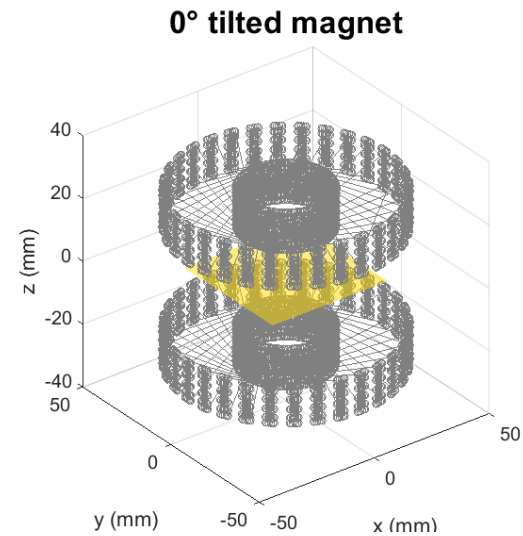
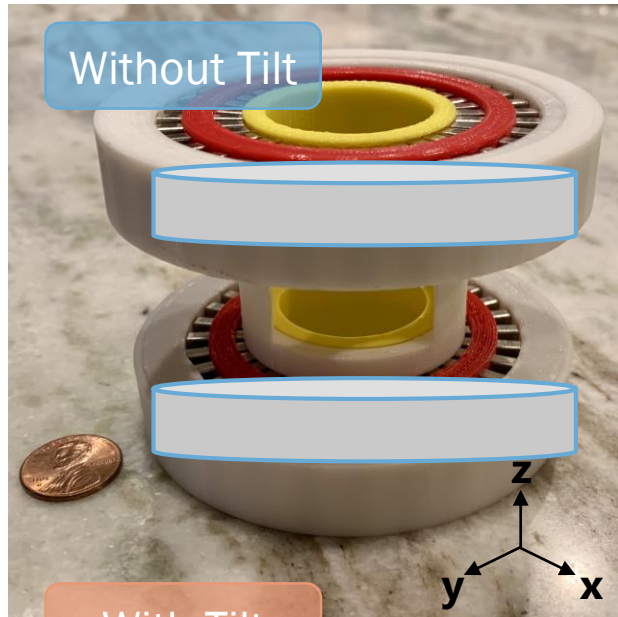
Optimized B0 using a calibrated equivalent-charge-based simulation



[6] Kuang et al., *Equivalent-Charge-Based Optimization of Spokes-and-Hub Magnets for Hand-Held and Classroom MR Imaging*. Int. Soc. Magn. Res. Med., 2019.

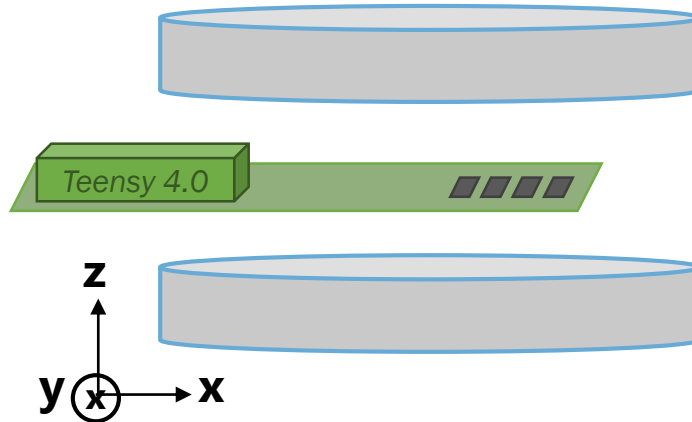
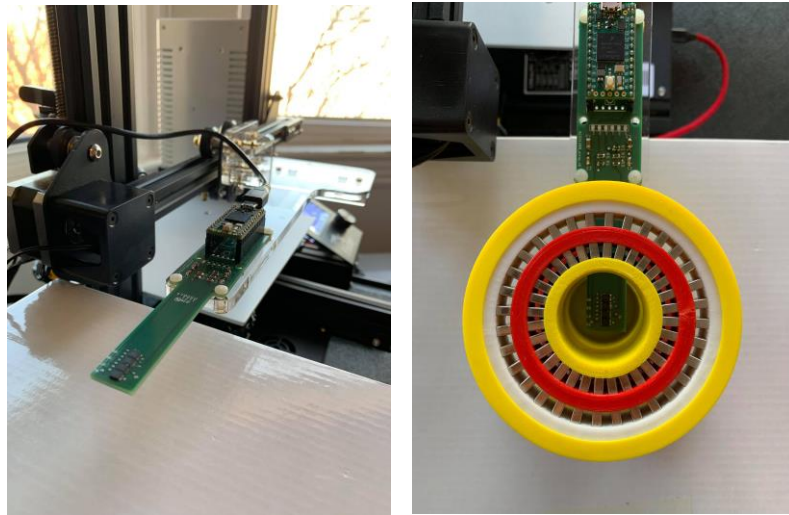
[7] Kuang et al., *Bloch-Optimized Dithered-Ultrasound-Pulse RF for Low-Field Inhomogeneous Permanent Magnet MR Imagers*. Int. Soc. Magn. Res. Med., 2020.

Simulated magnetic fields patterns

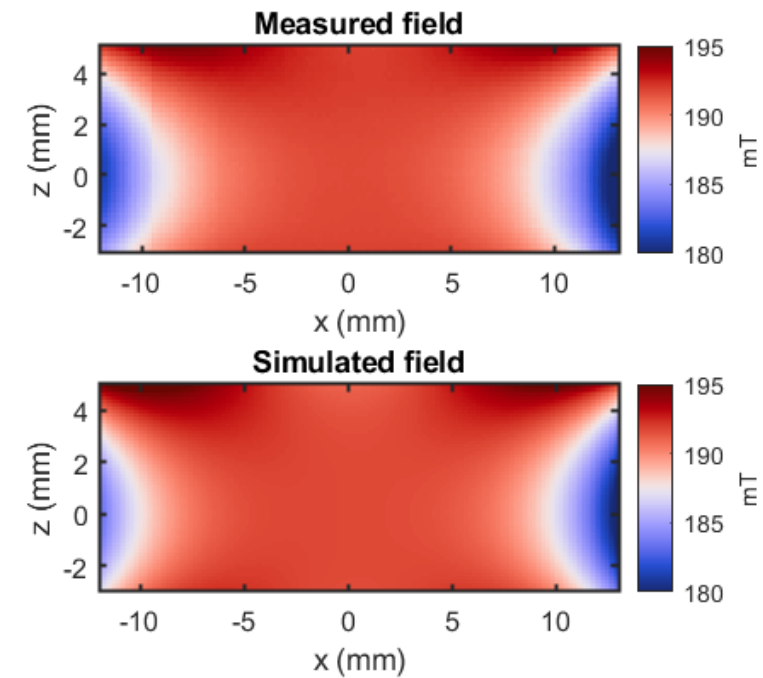
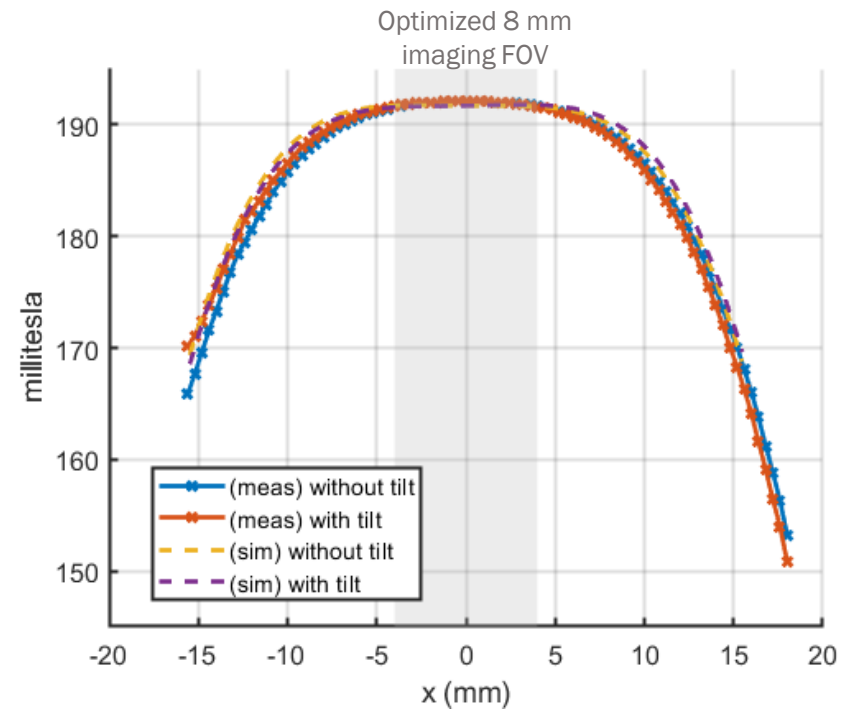


[6] Kuang et al., *Equivalent-Charge-Based Optimization of Spokes-and-Hub Magnets for Hand-Held and Classroom MR Imaging*. Int. Soc. Magn. Res. Med., 2019.

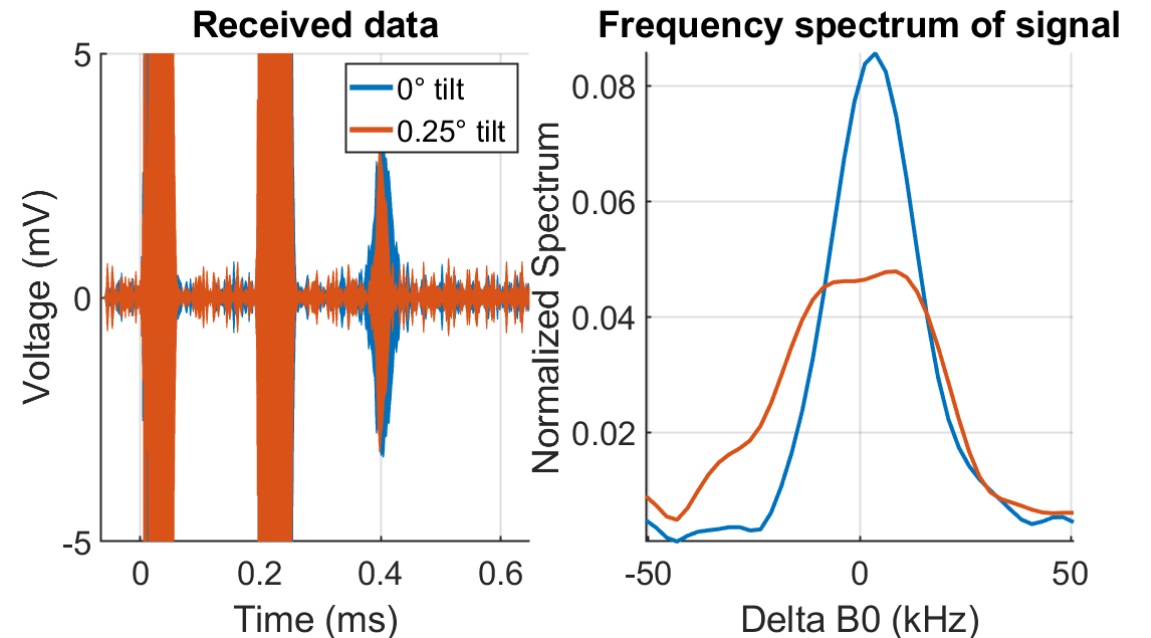
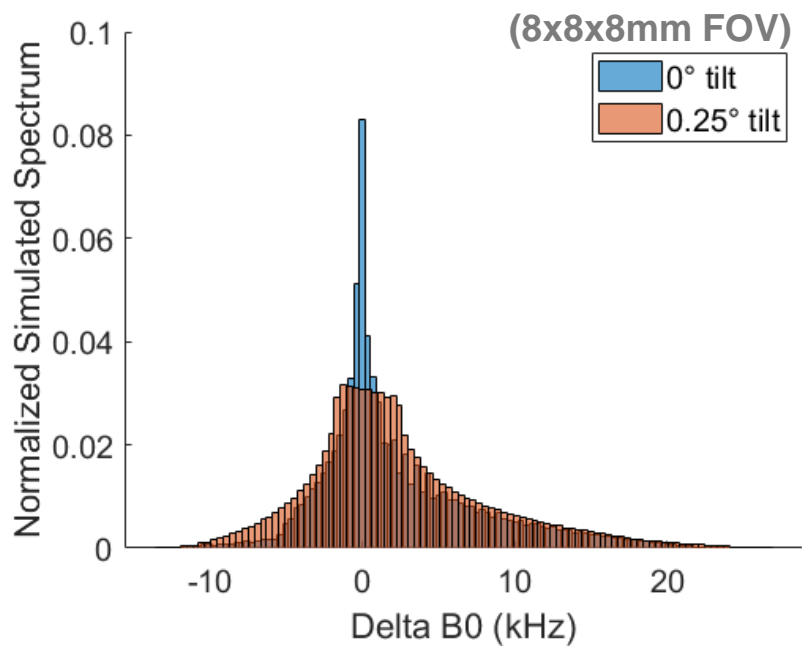
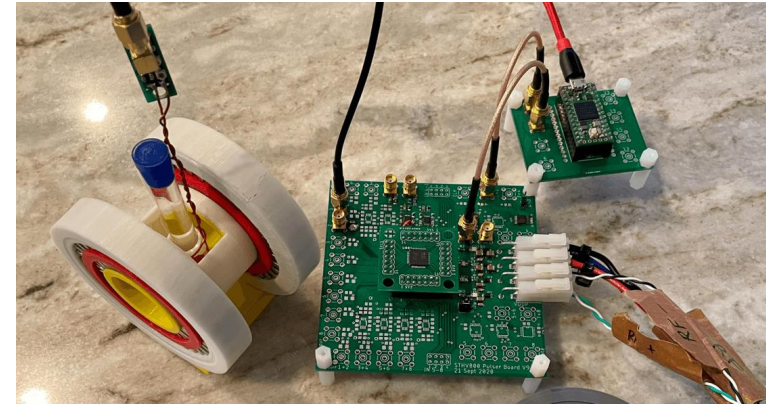
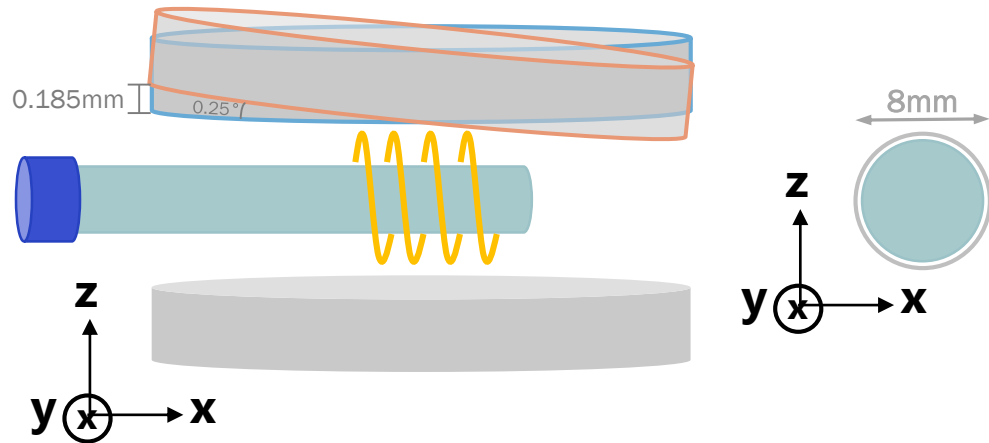
Field map measurements



ALS31300 3D Linear Hall Effect Sensor (12-bit ADC)
 Sensor range: ± 2000 Gauss, Sensitivity: 1 LSB/Gauss
 Sensitivity error: $\pm 0.6\%$, Offset error: ± 12 LSB
 RMS noise: 1 LSB

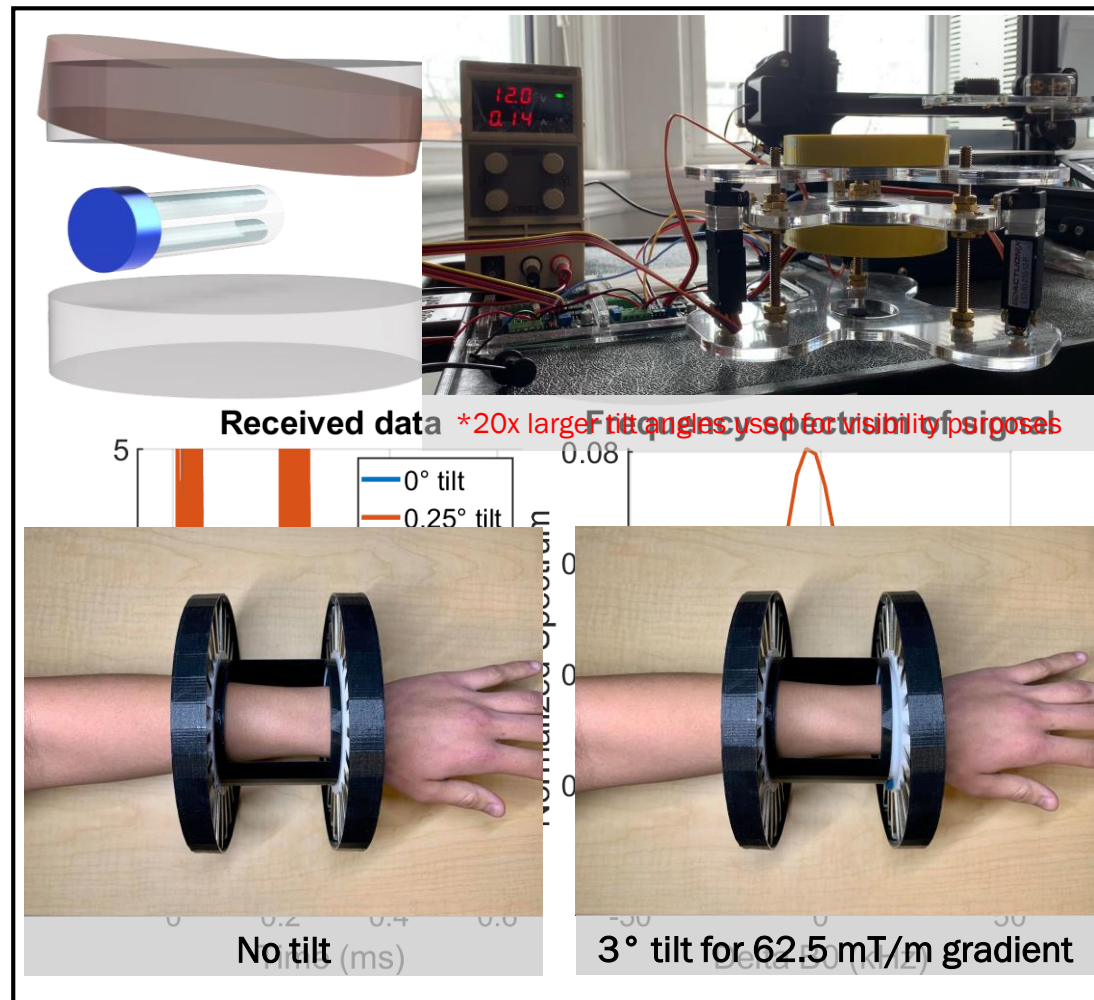
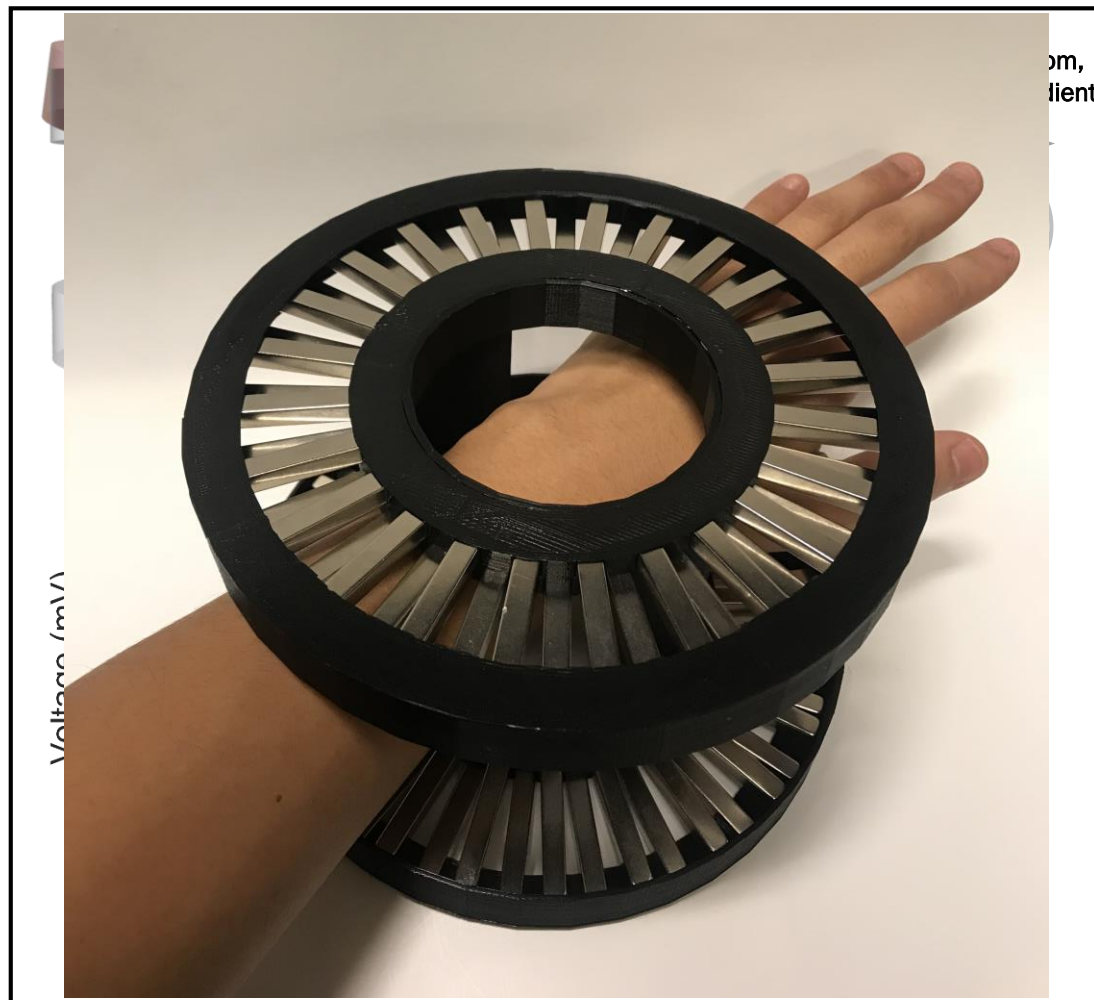


Tilted-gradient experiment setup



Sampling bandwidth, $BW=125\text{MHz}$; Readout points, $n_s=12875$
 $TE=0.4\text{ms}$ (to reduce impact of $T2^*$)

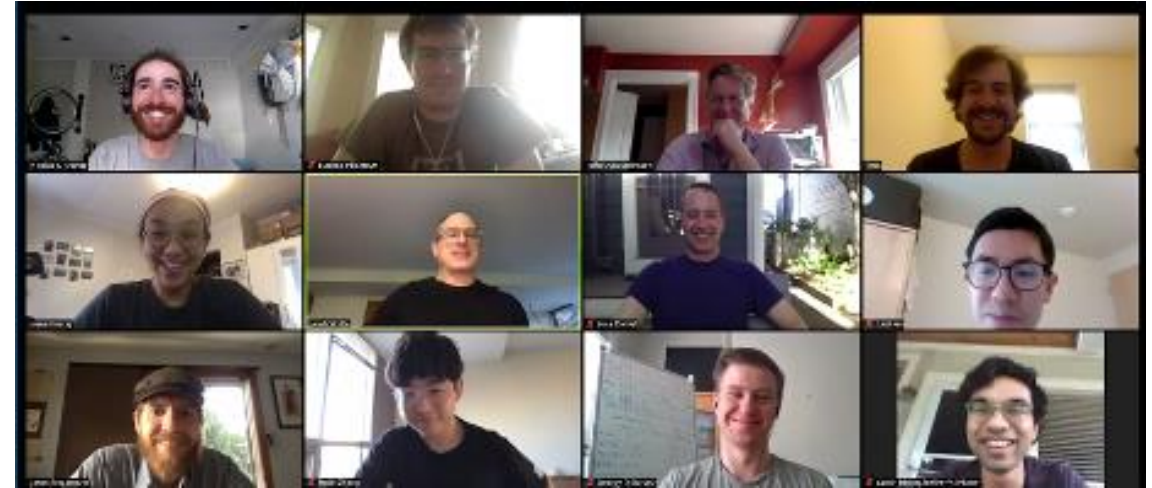
Tilted-gradient experiment results



Sampling bandwidth, $BW=125\text{MHz}$
Readout points, $n_s=12875$

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Live Q&A

Parent Session – Systems Engineering I
Poster Session Name – Hot-Wired Systems: Gradients & Magnets
Wednesday, 19 May 2021
17:00-18:00 UTC



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ISMRM, 19 May 2021

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