

Weekly Updates 4

Thursday, July 7

Devdigvijay Singh

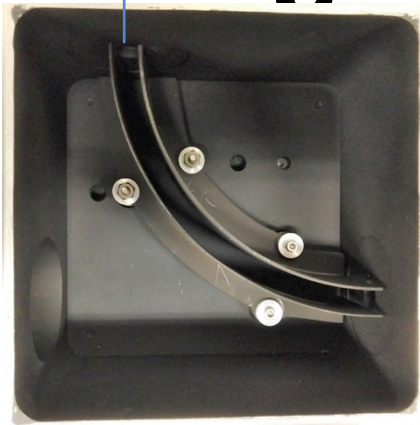
More Fireflies



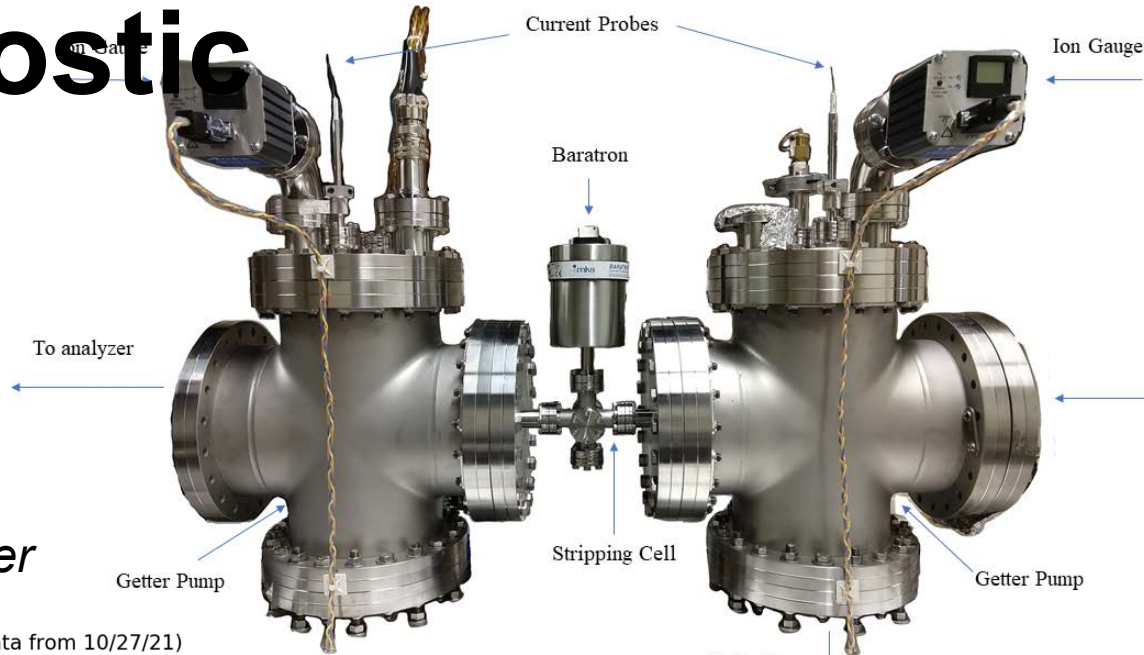
Ion Energy Analyzer

Channeltron

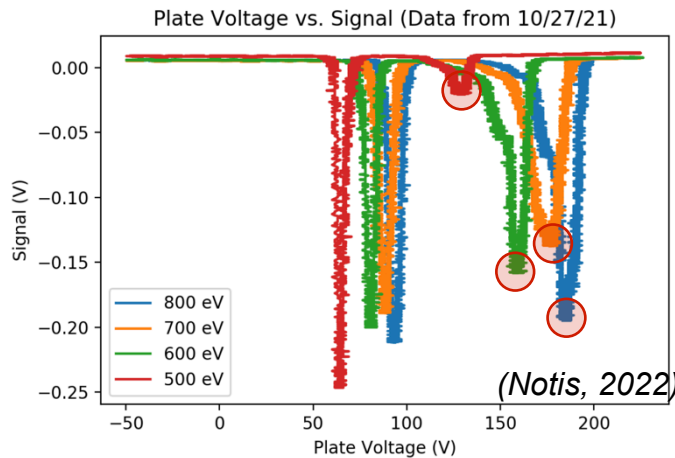
Diagnostic



Curved-plate analyzer



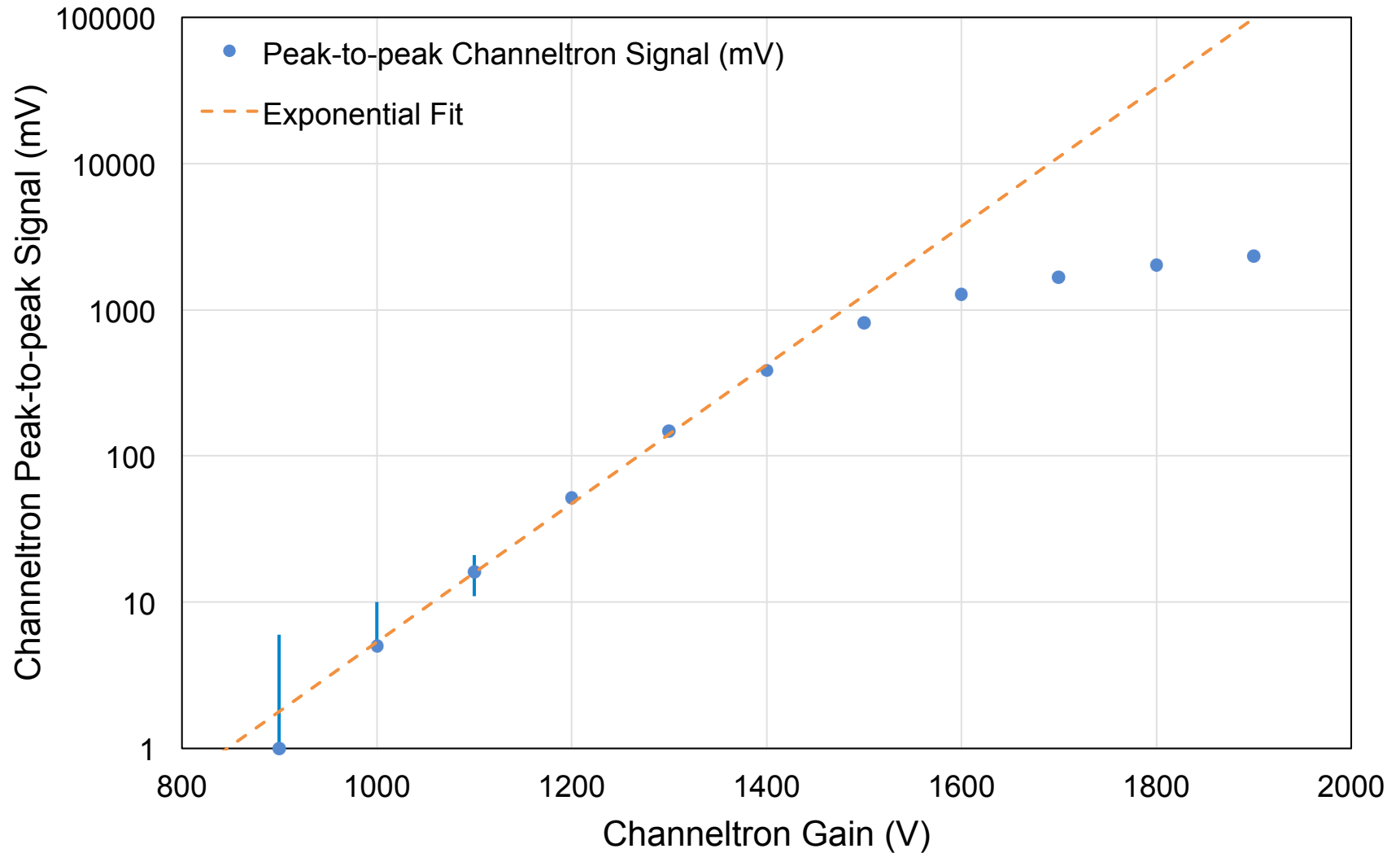
Ion Gun



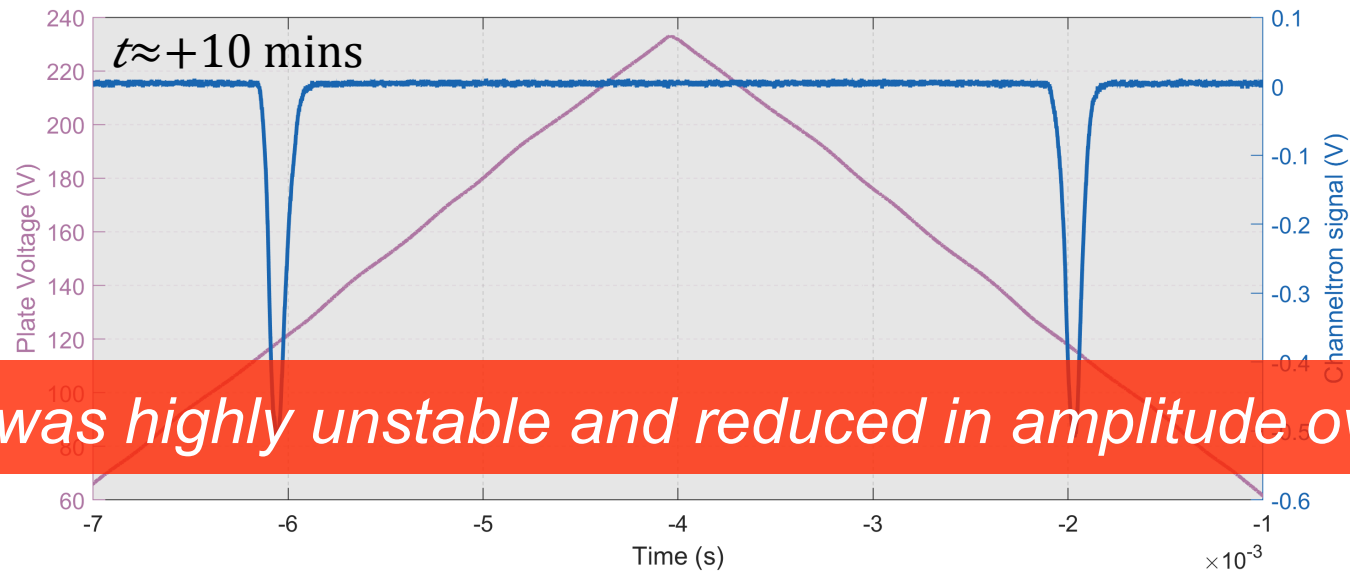
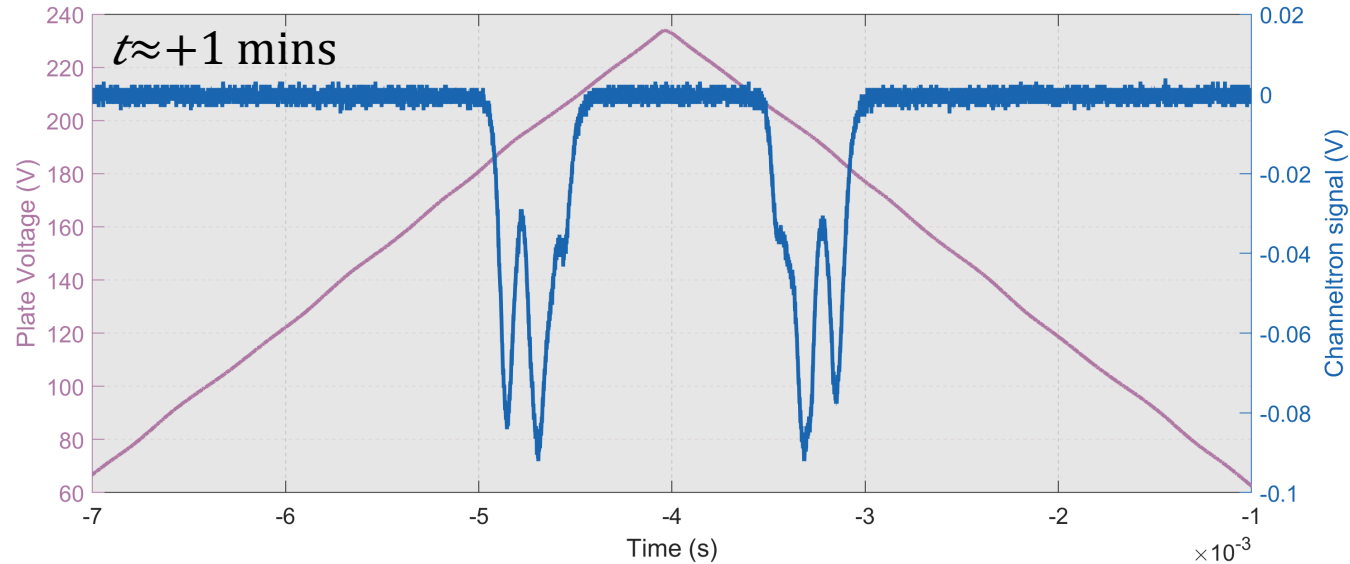
Unexpected 2nd energy peak

Goal: Reproduce Noah's experiment and investigate origins of this peak

Varying Channeltron Gain

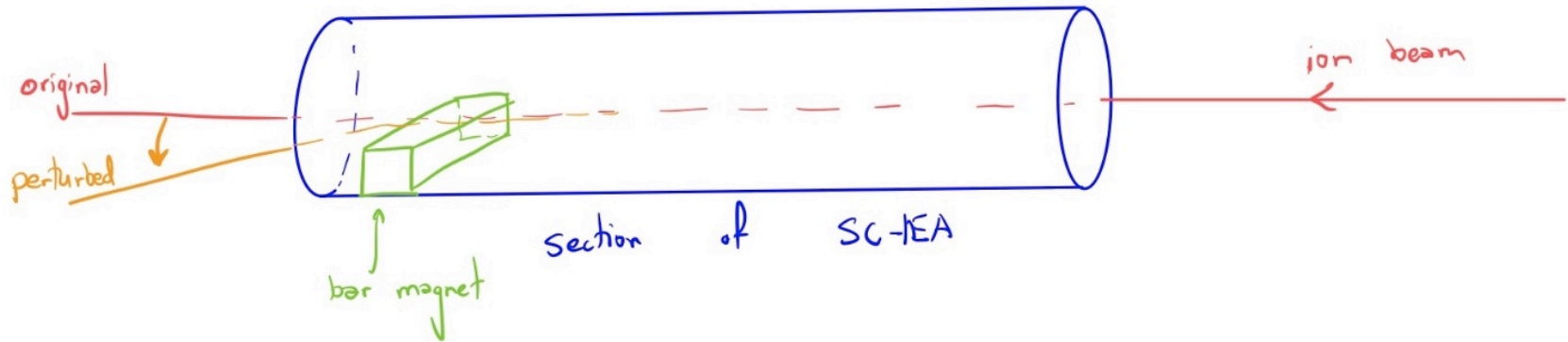


Observations from Initial Run



Signal was highly unstable and reduced in amplitude over time

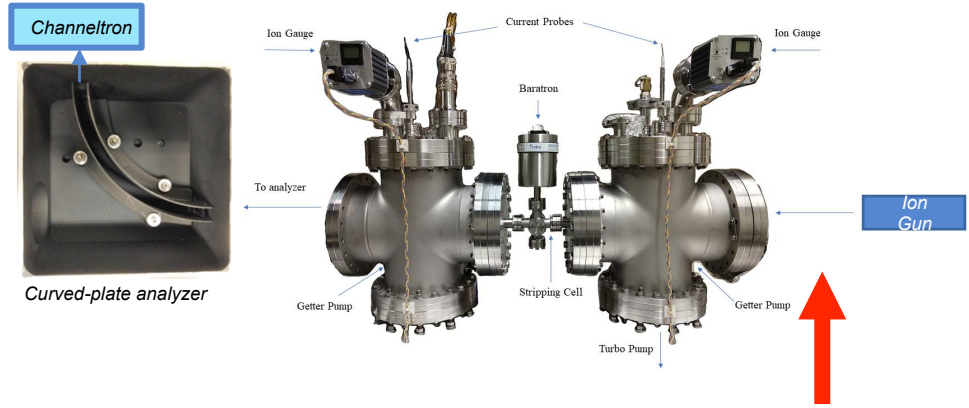
Using external B-field to deflect signal



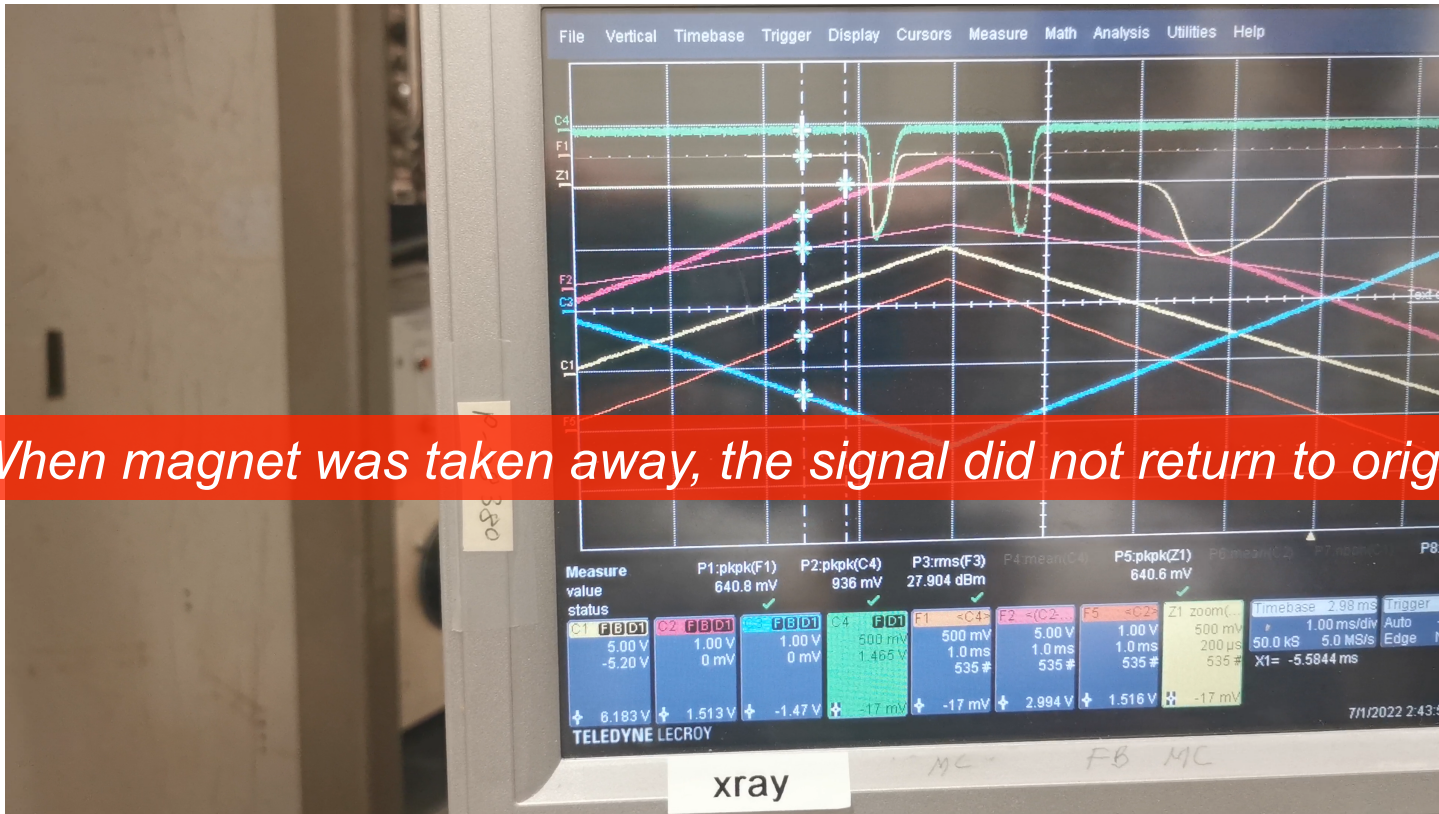
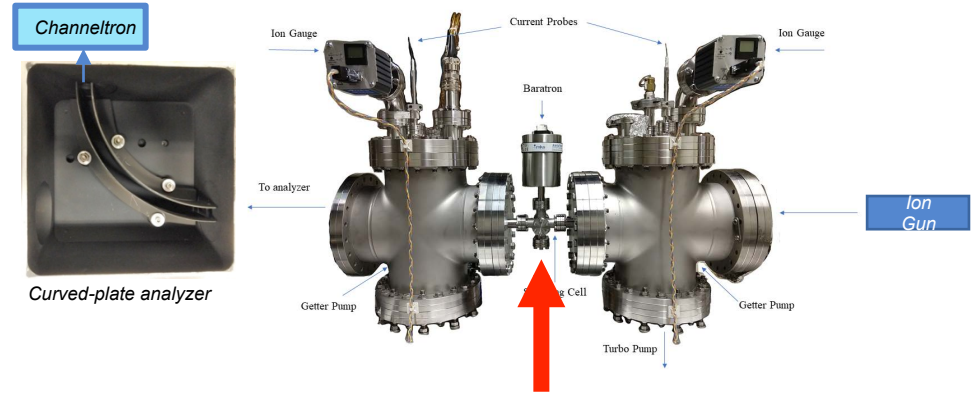
Move bar magnet closer and further on different sections of the SC-IEA to deflect ion beam

Informs us of misalignments if signal gets stronger

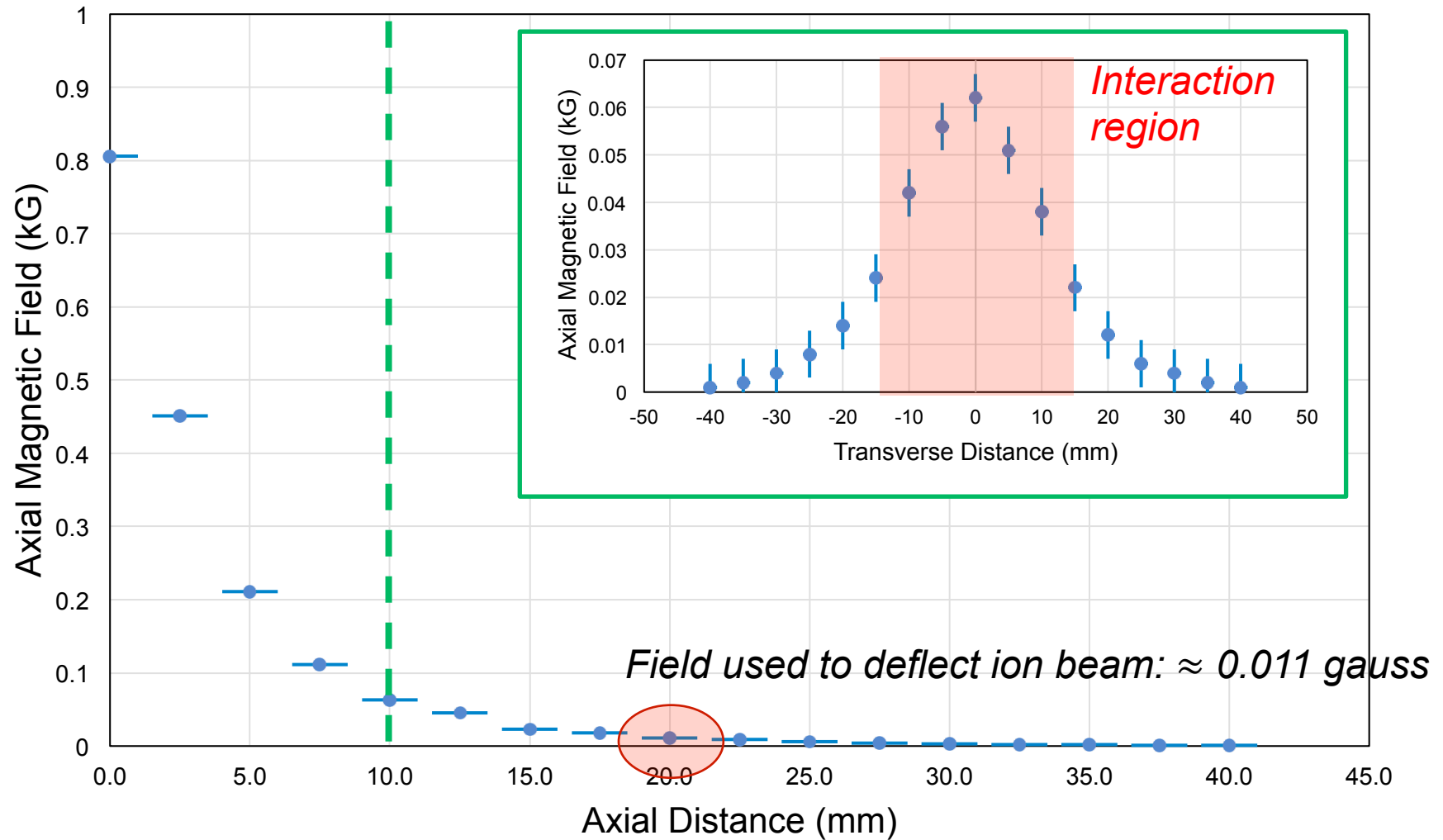
Using external B-field to deflect signal



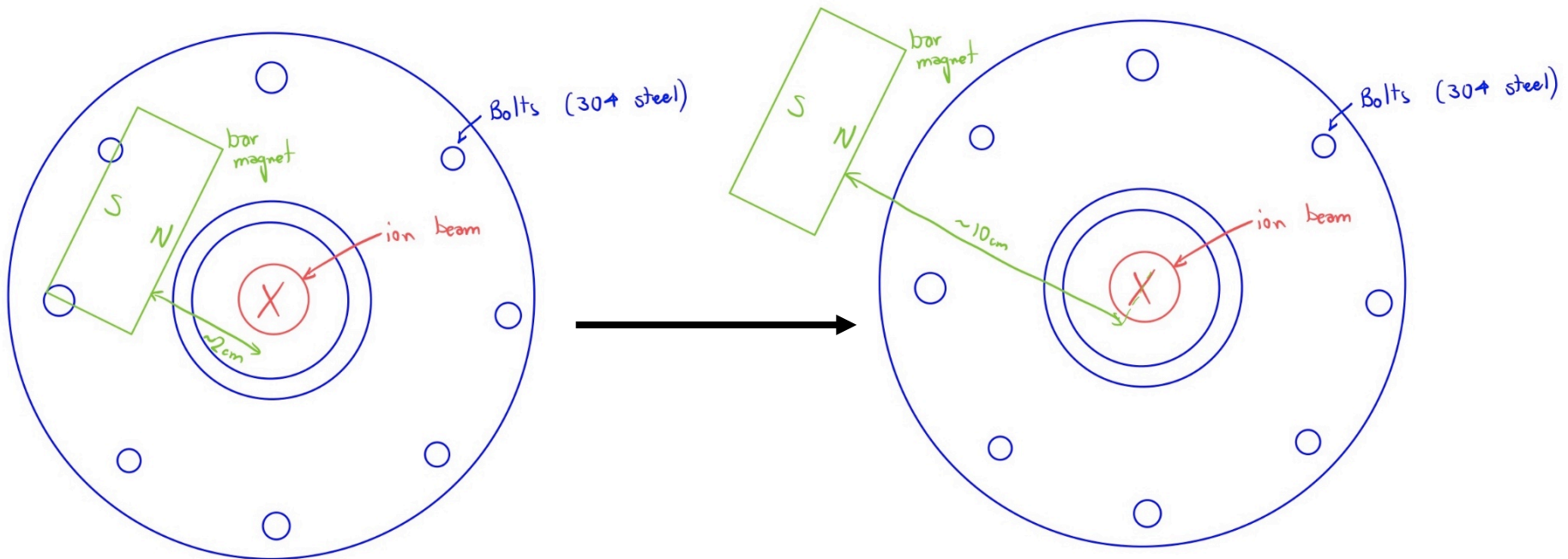
Using external B-field to deflect signal



Mapping out permanent magnet

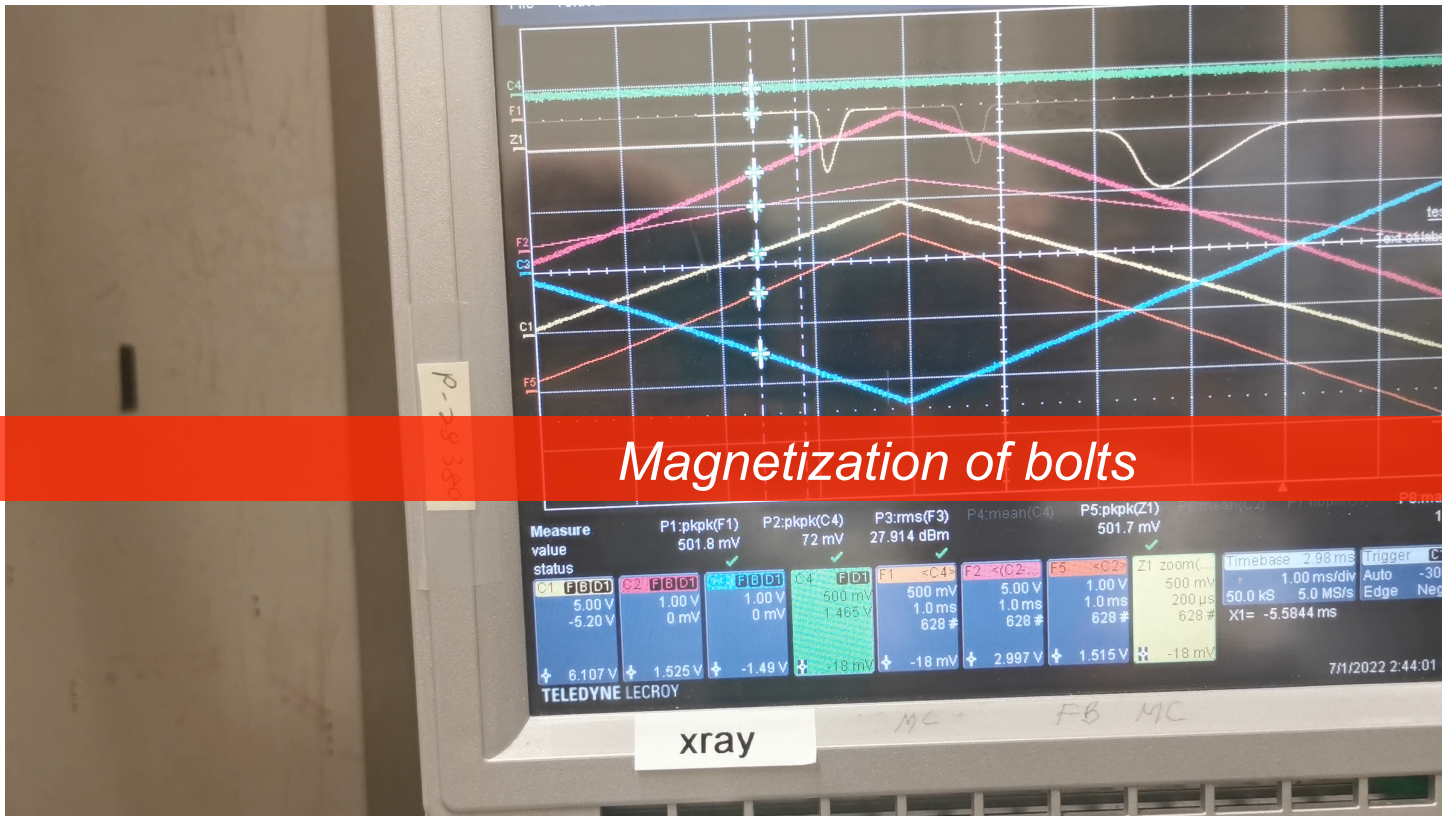
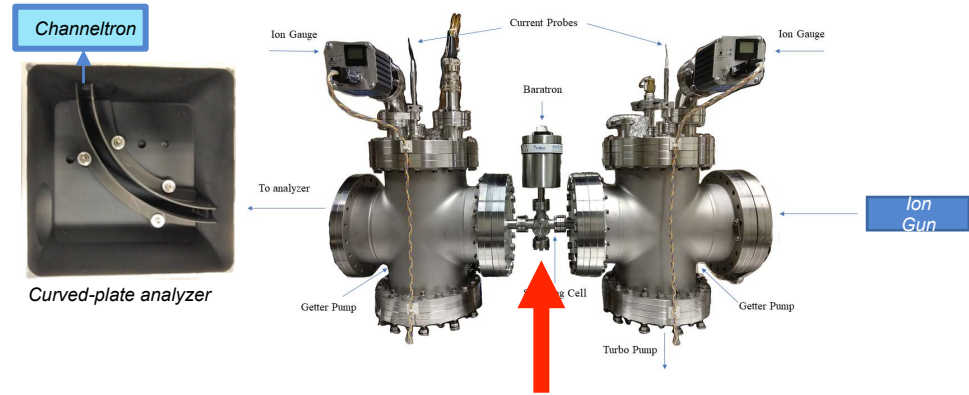


Mapping out permanent magnet field

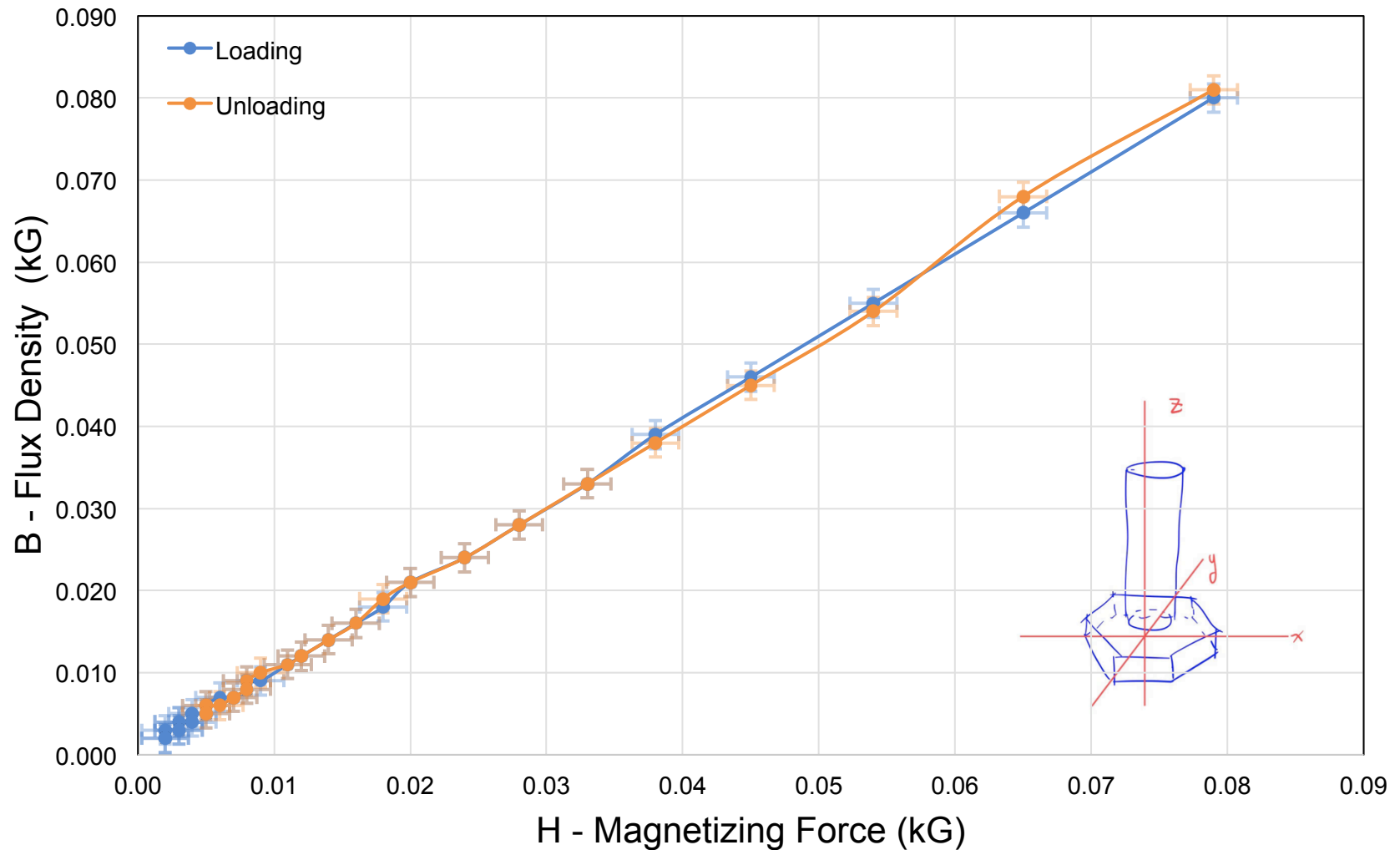


*Magnetic field is near negligible
at this distance*

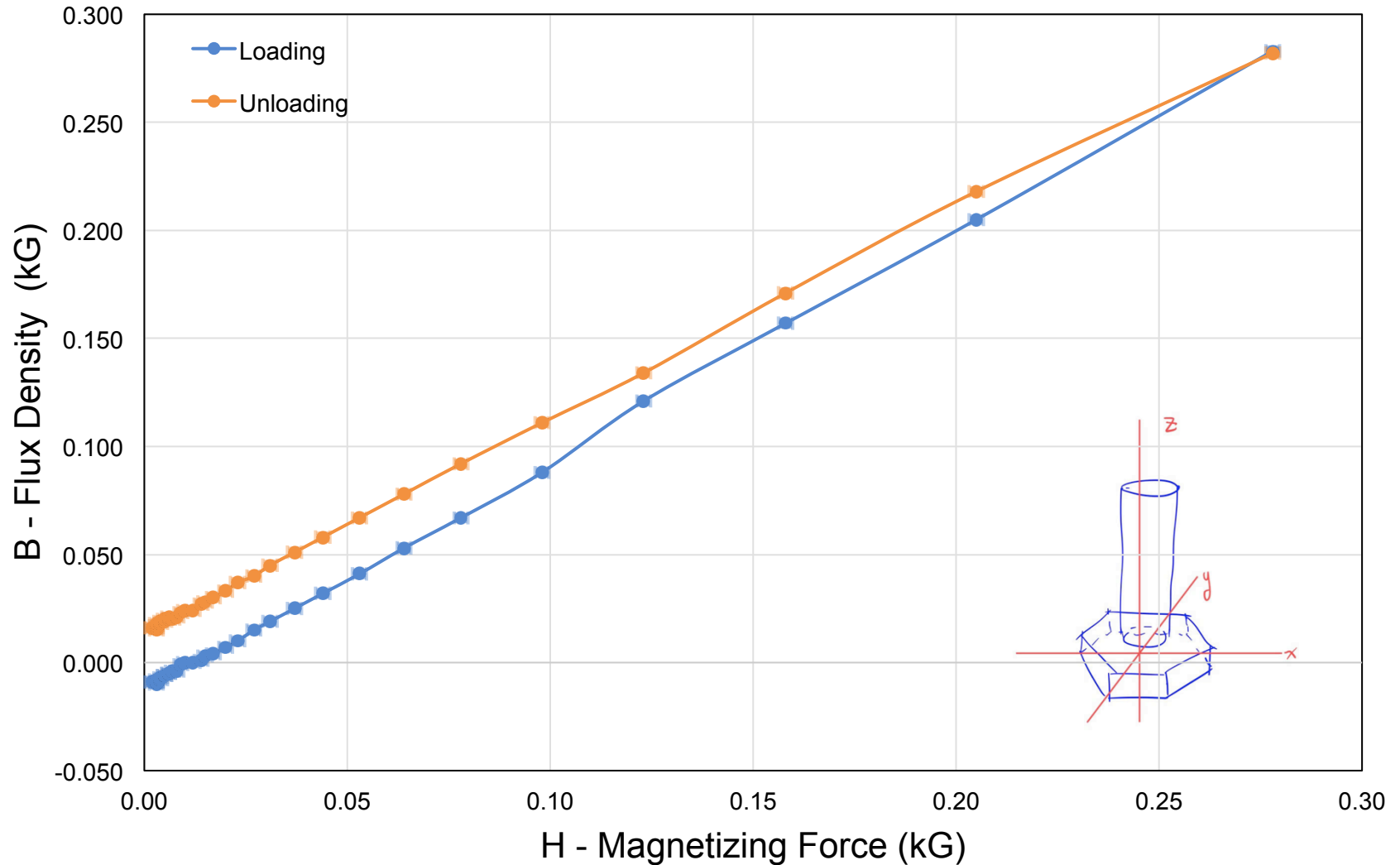
Using external B-field to deflect signal



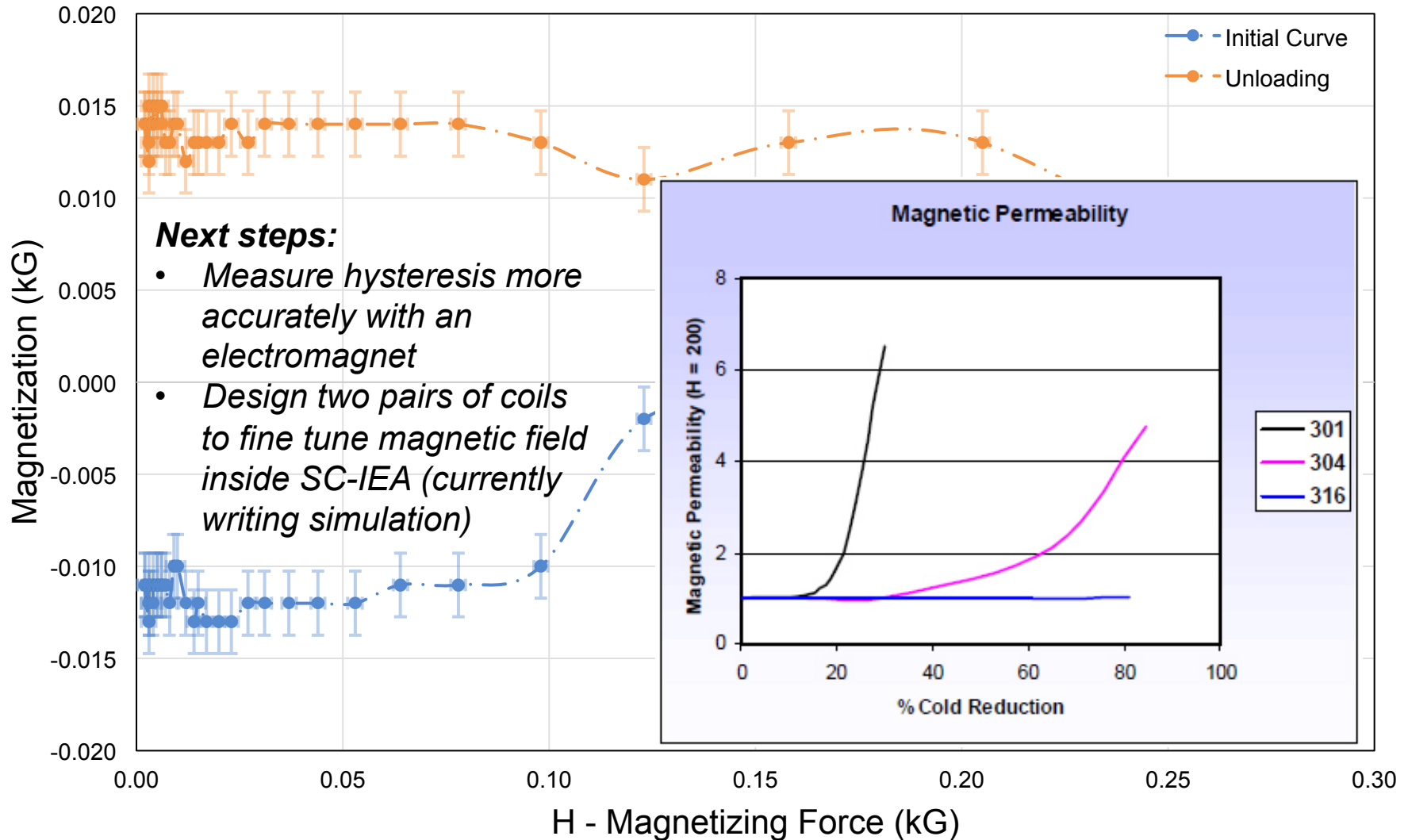
Z-directional hysteresis



X-directional hysteresis



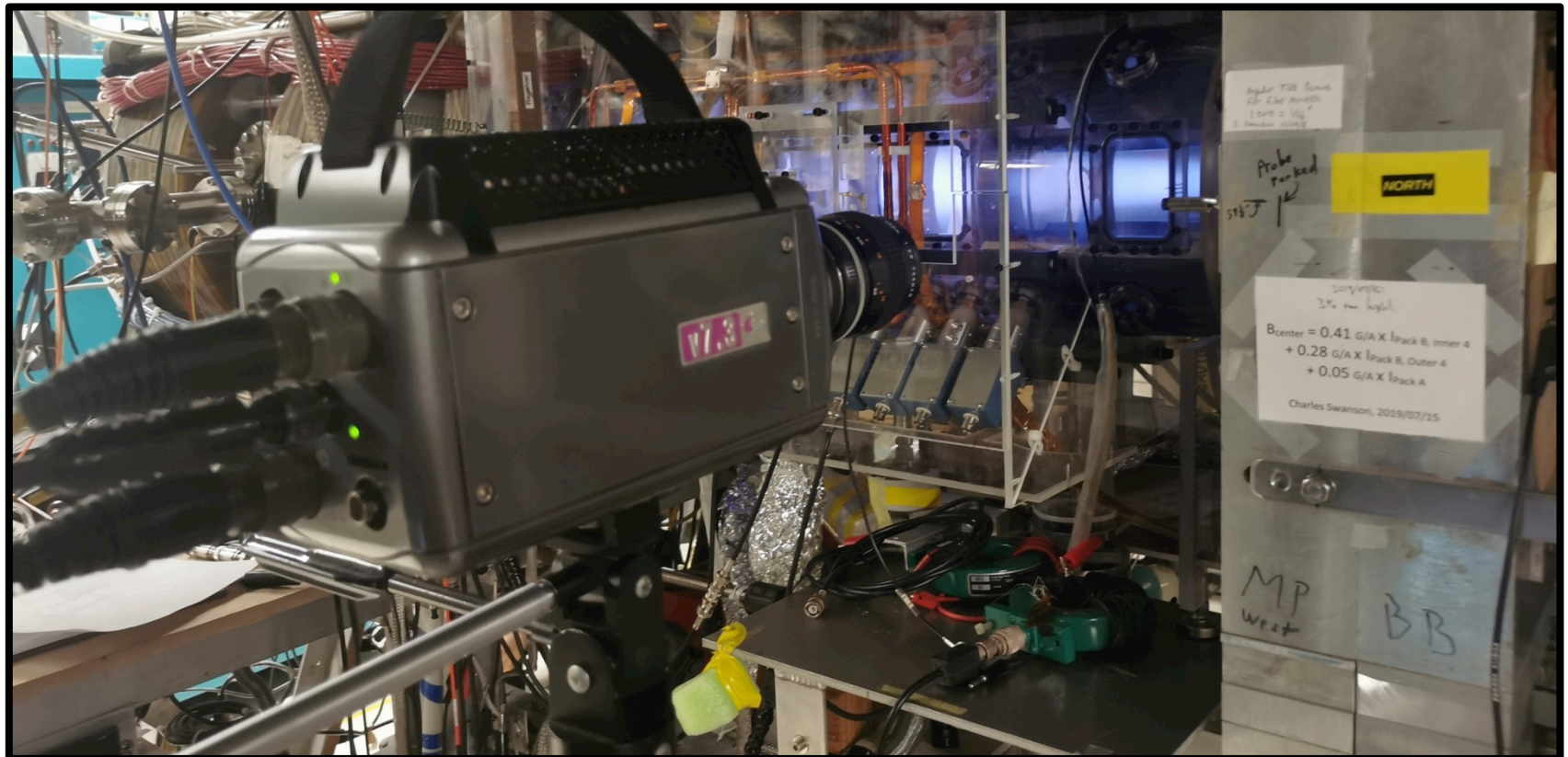
X-directional hysteresis



Phantom Camera

Images taken with a traditional camera is a time-average over many rotations of the plasma

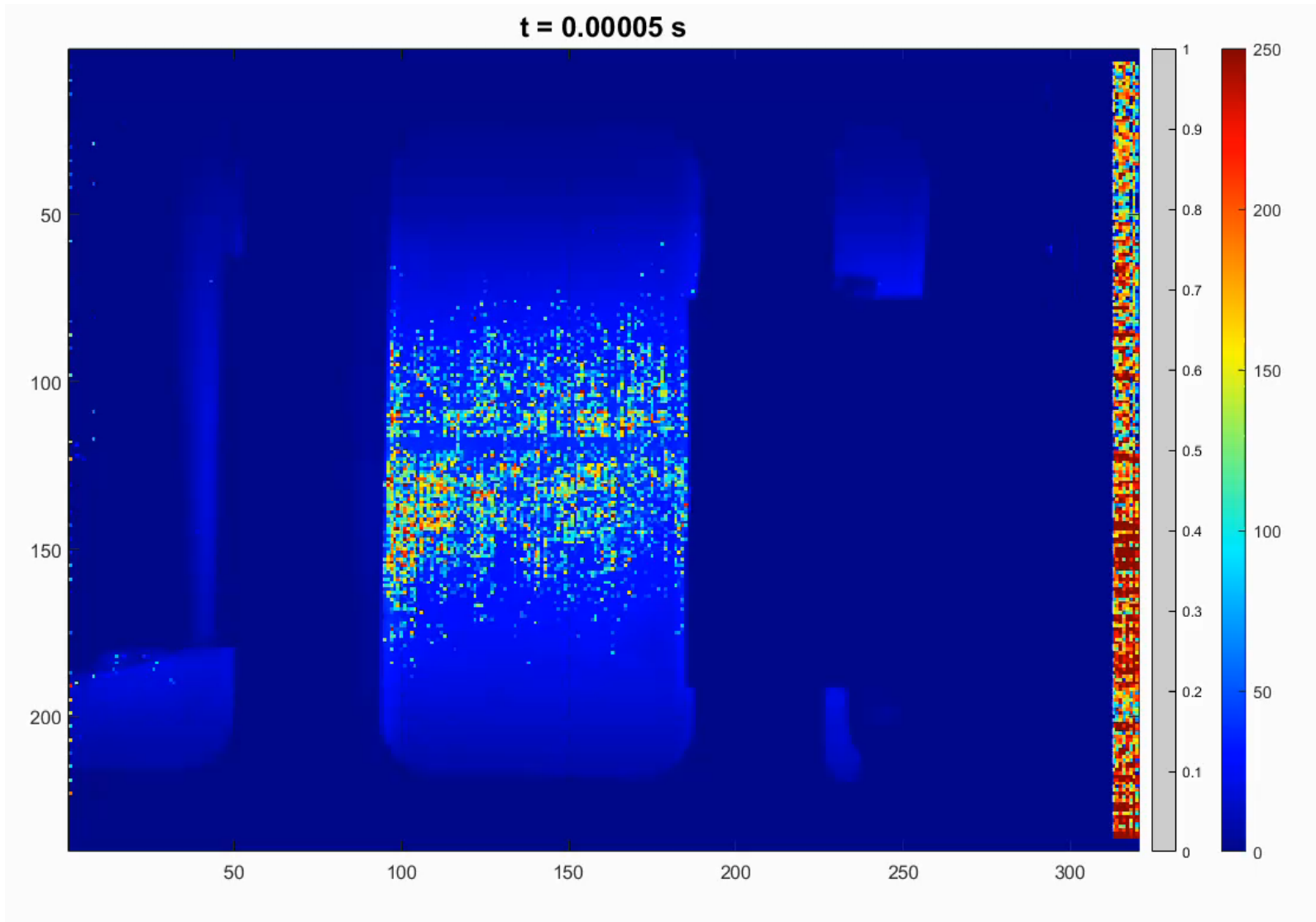
Leads to errors in the Abel inversions for electron distributions



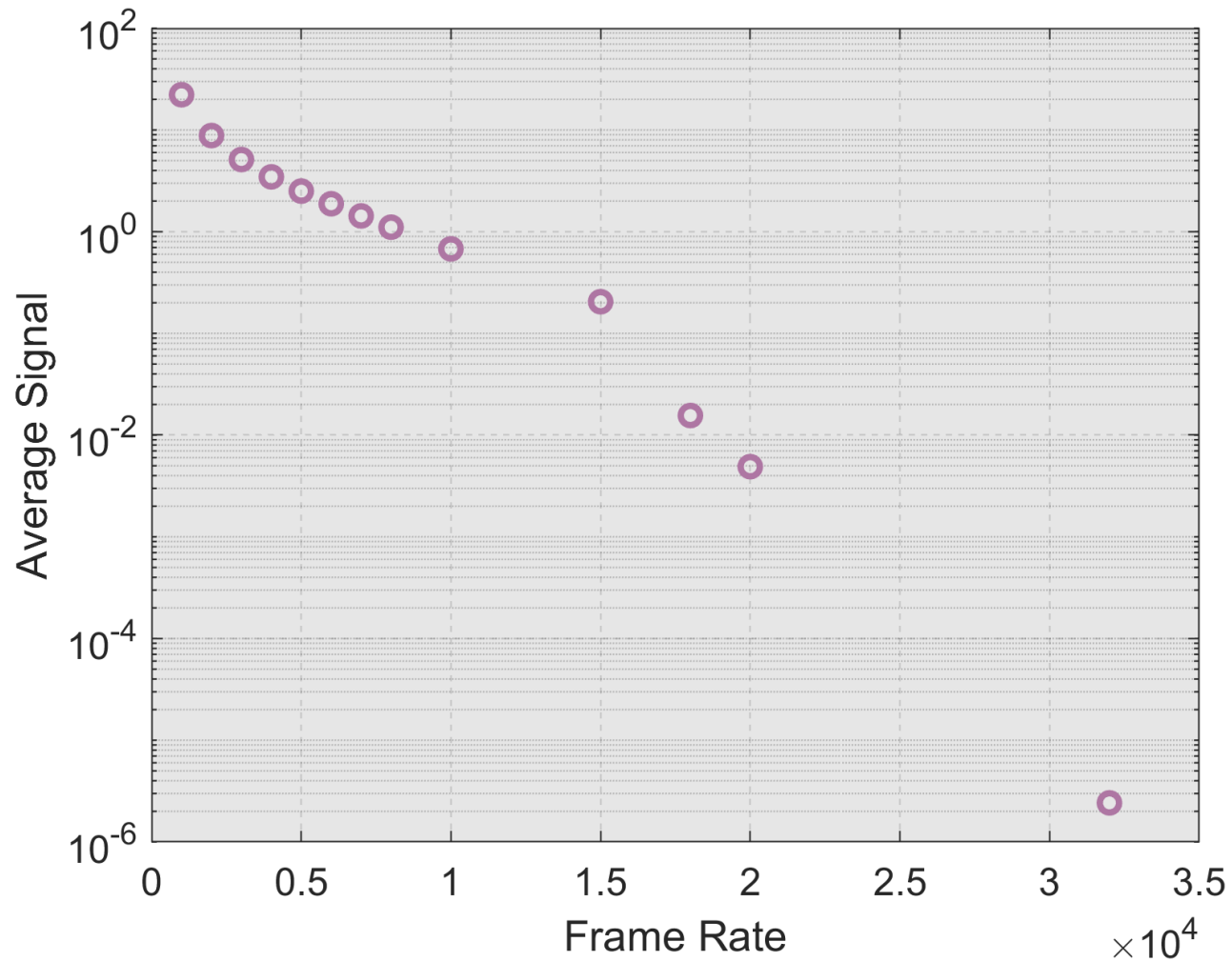
Phantom Camera @ 1k fps



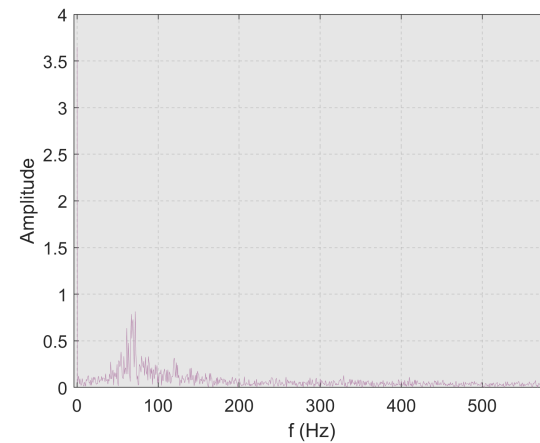
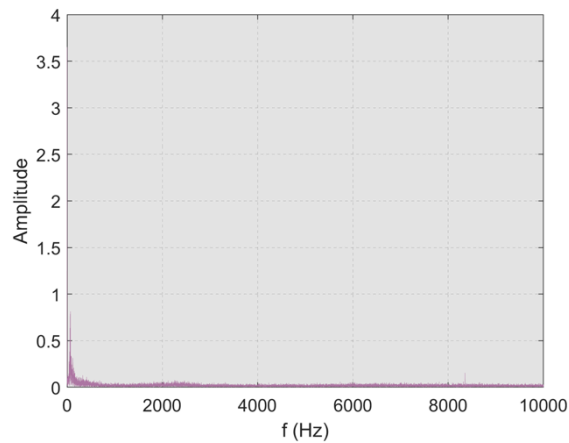
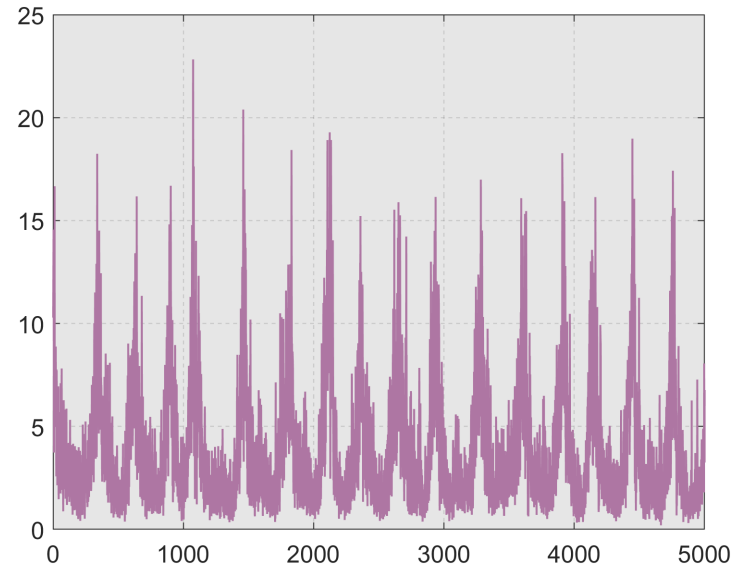
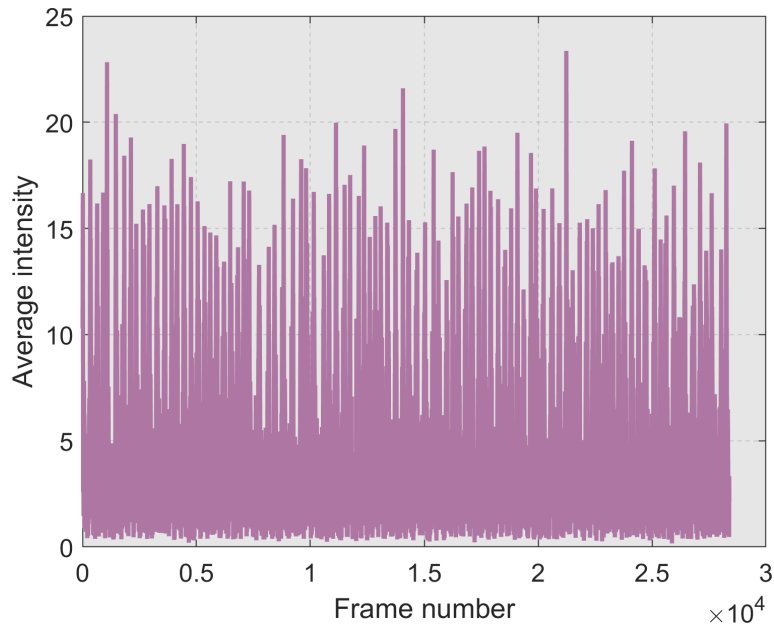
Phantom Camera @ 20k fps



Phantom Camera SNR



Phantom Camera @ 20k fps



Phantom Updates and Next Steps

Each file is ~20 GB

- *Finished batch processing 20 files from yesterday and setting up a hard drive to temporarily store files*
- *Beam position vs. time*
- *Beam width vs. time*
- *Background noise estimation vs. frame rate*