Mapping on the July 30/31

Magnetic shield meeting

31/07/2019

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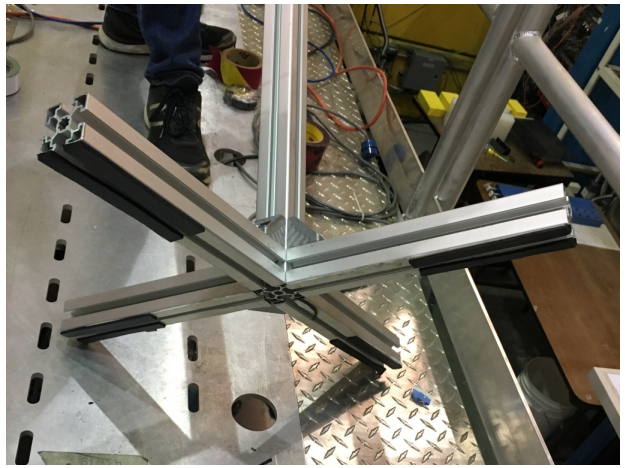
Contents

We recorded some mapping data this week.

- Preparation
- Coordinate definition
- Some results (reproducibility check)
- Limitations

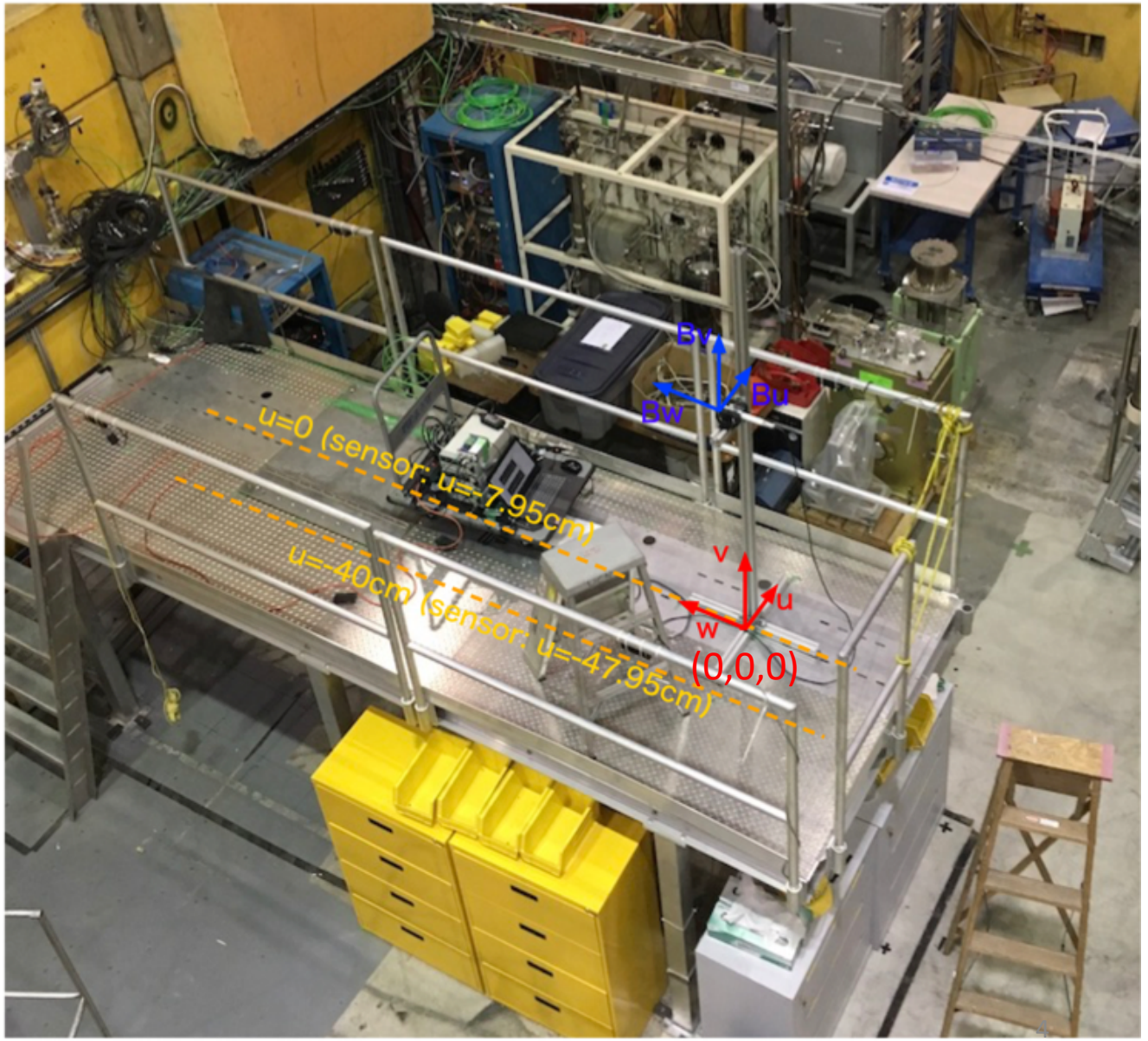
Preparation



- The existing pole stabilized with rubber sheets
- A new pole of 1.4 m height prepared for the floor level measurement (the existing one is too tall)
- Magnetic components beneath the platform were moved (thanks to Wolfgang!) Obstacles (the SCM rails, some screws) removed
- Marked grids with 40cm intervals on the floor and on the platform (projected laser pointer from the platform to the floor to mark common (0,0))

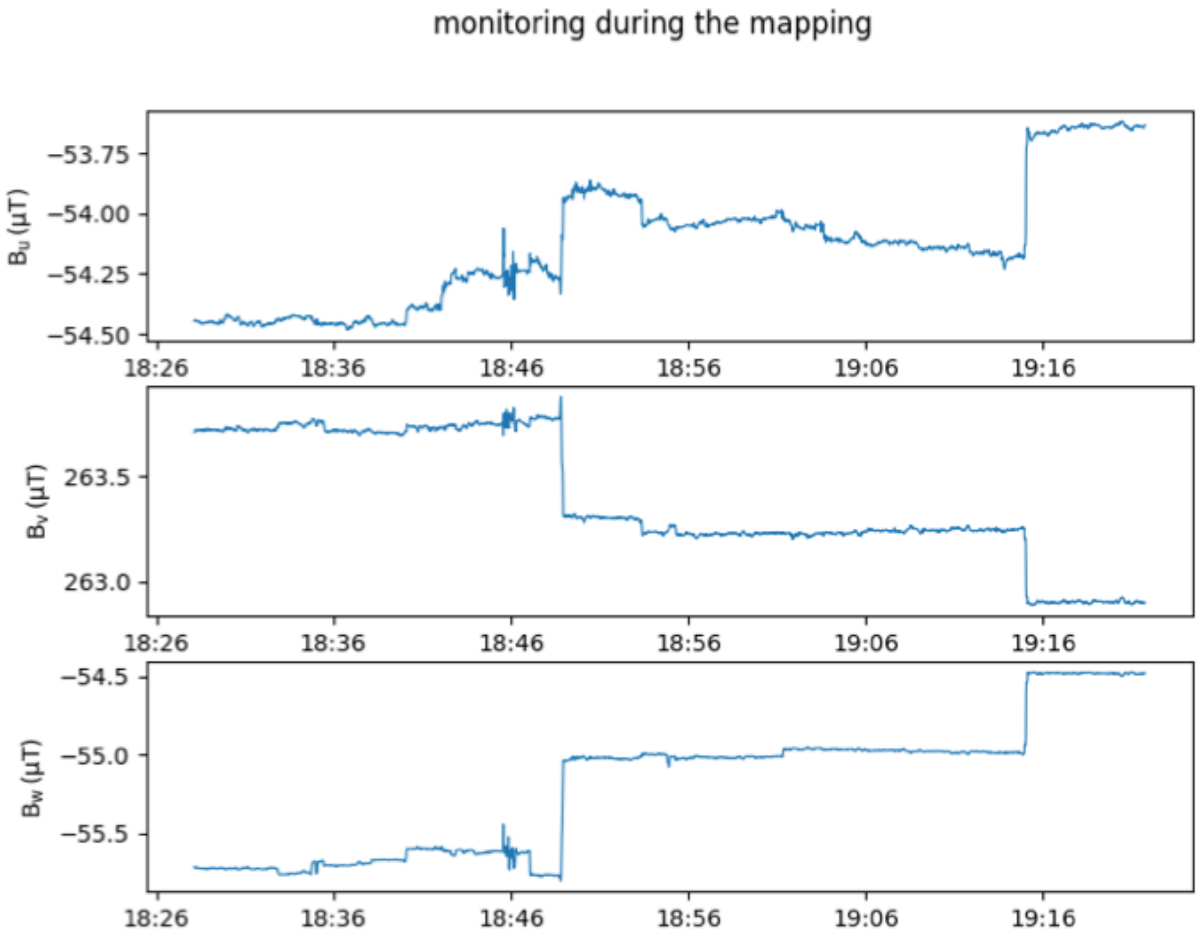
Coordinate system

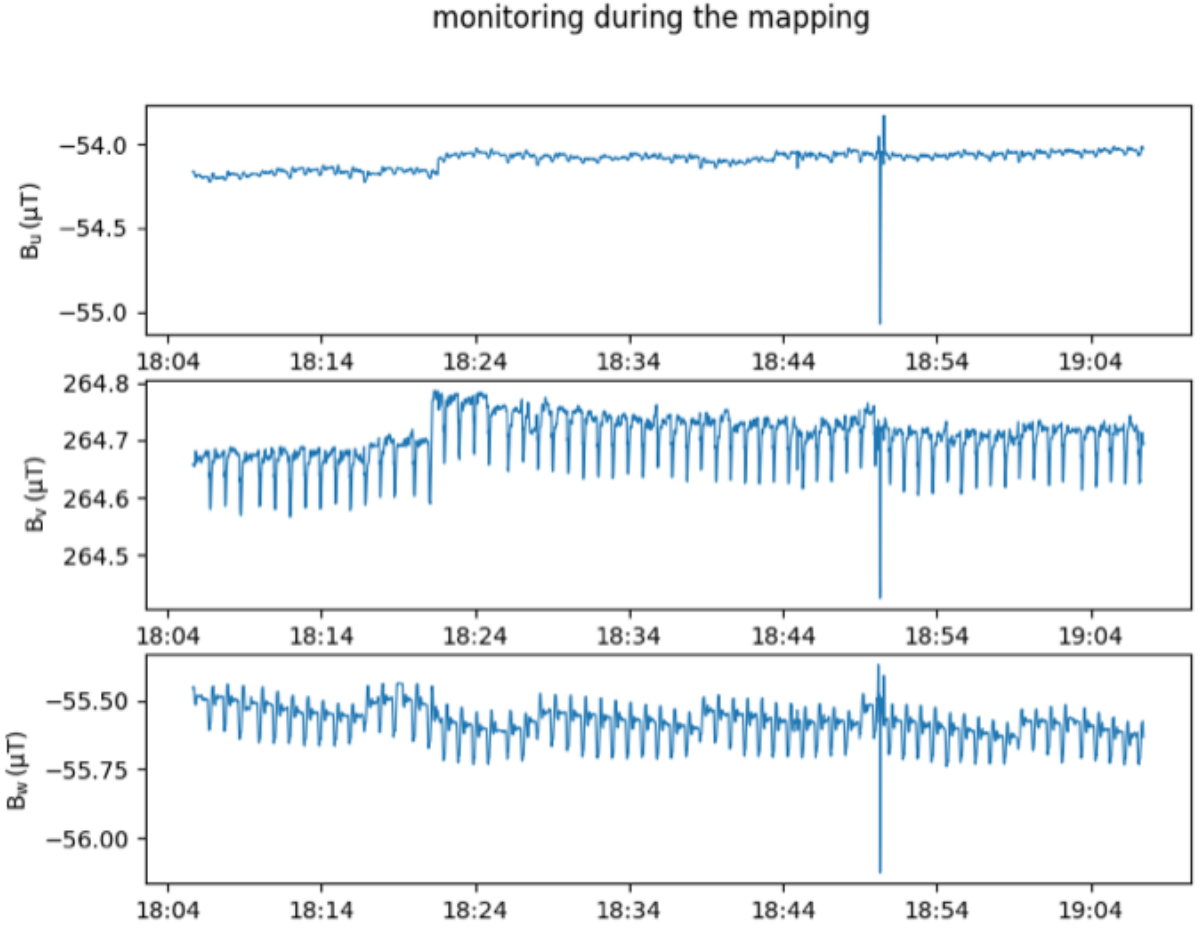
- Marked grids with 40cm intervals (on the floor and on the platform)
- The position in the picture on the right: (u,v,w) = (0,0,0)
- v=0 is ~~1.74 m~~ 1.882 m higher than the floor (thus, the floor level is v=-1.882m)
- We performed measurements along the two orange lines (30/07:on platform, 31/07:on floor)
- Some points on the platform done with vertical offset of about 50mm (e.g. SCM stage)



Stability during the measurement

- The five-fluxgate system was running in parallel to the measurement, shown here the one on the leg of the platform (fluxgate3)
- Field variations during the measurements: within < 1.2 uT
- Spikes observed on 31/07





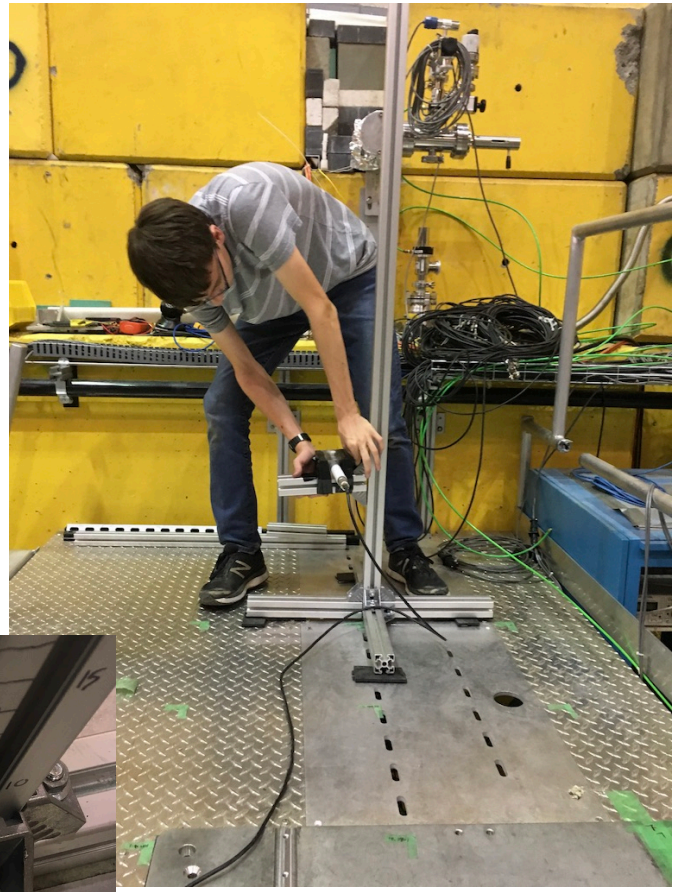
Measurements/Reproducibility check

- 30/07: scans on u=0, -40cm on the platform (40cm interval)
- 31/07:
  - scans on u=0, -40cm on the floor (40cm interval)
  - scans on u=0, -40cm on the platform (80cm interval)

- More details:
  - Horizontal position of the probe defined by the marker (offset to the probe position measured)
  - The holder was supported by hands to fix
  - 5 measurements per position (300ms interval)

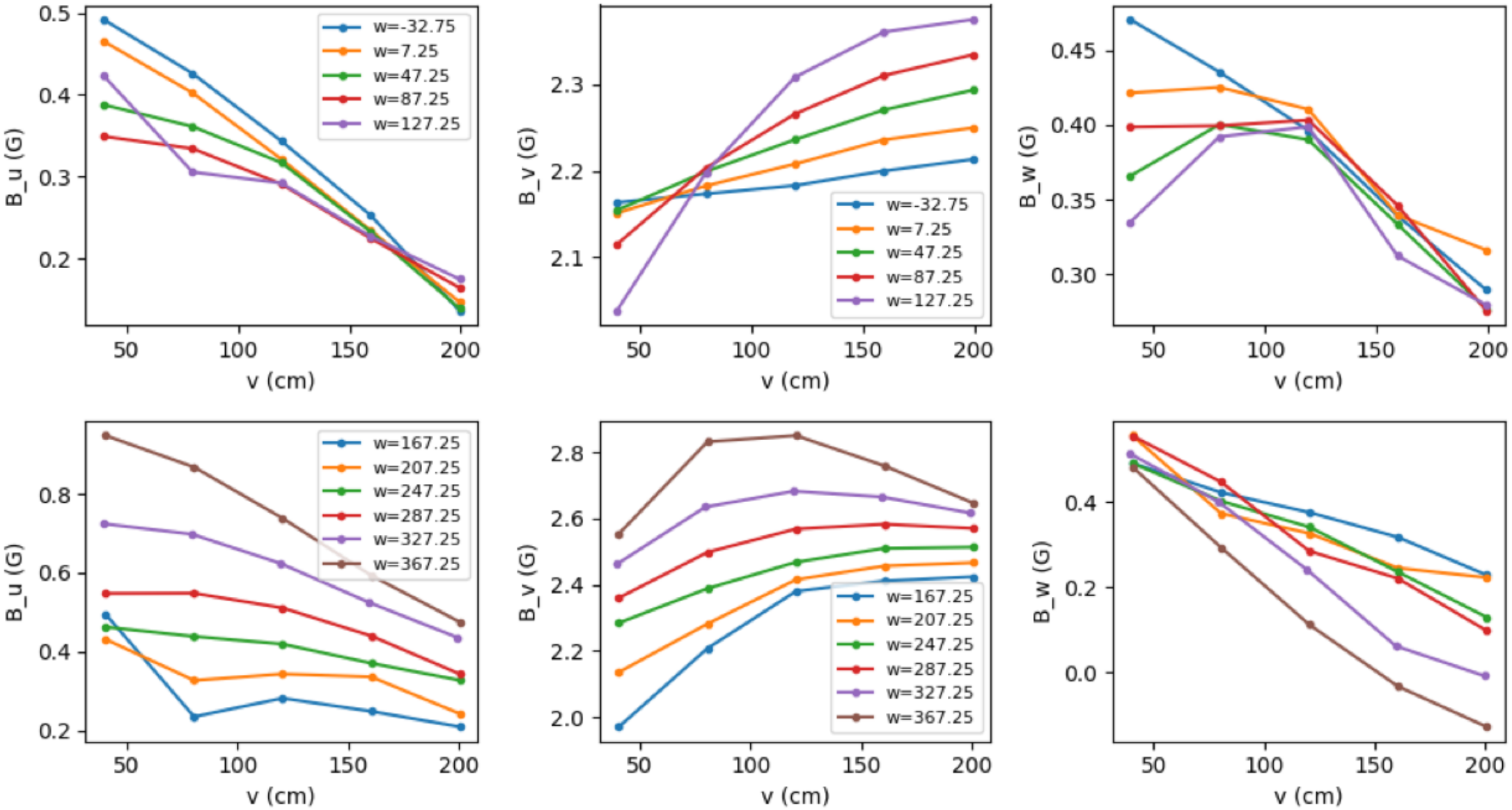
- Next pages:
  Compared u=0cm (-7.95 cm for sensor) results

Adjusting…

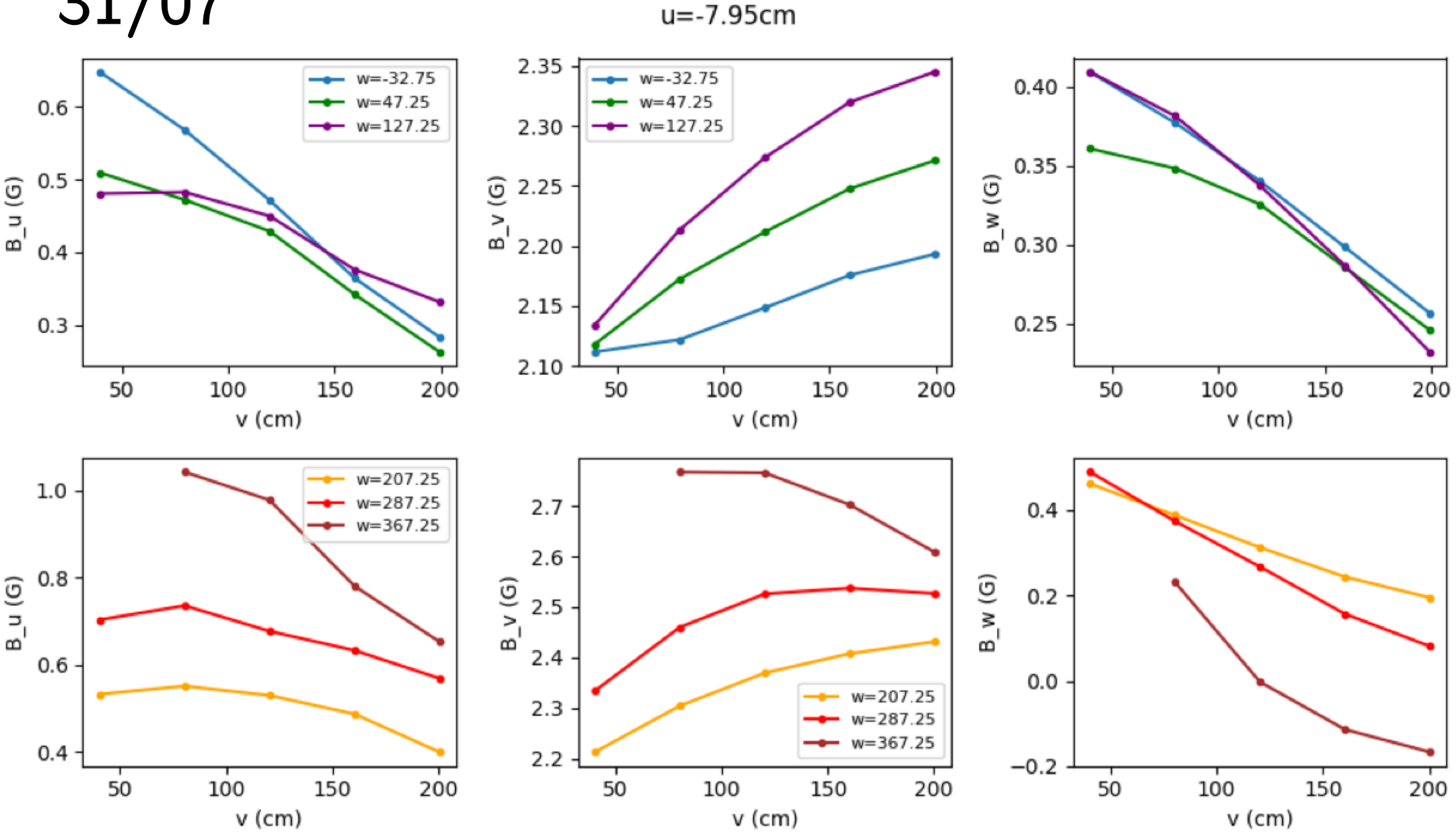


30/07

u=-7.95cm


B_u (G)
B_v (G)
B_w (G)
v (cm)
w=-32.75
w=7.25
w=47.25
w=87.25
w=127.25
w=167.25
w=207.25
w=247.25
w=287.25
w=327.25
w=367.25

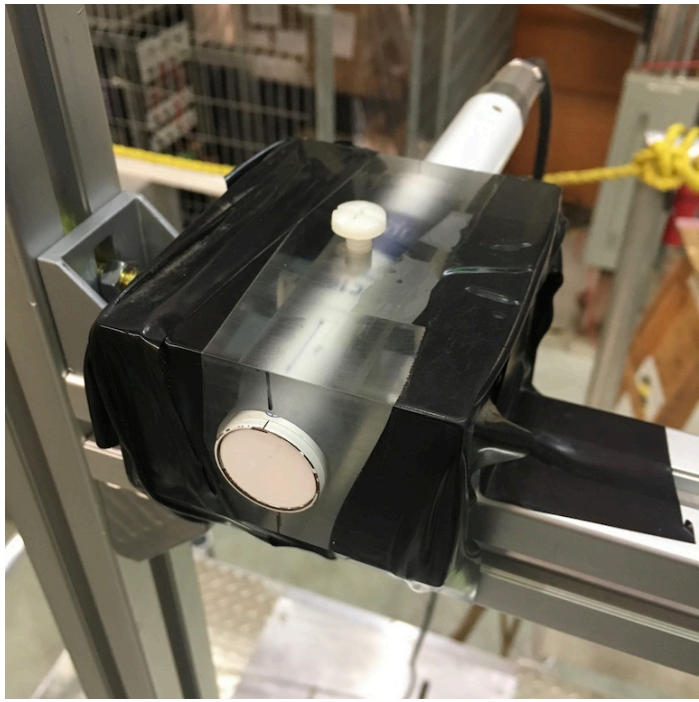
31/07


u=-7.95cm
w=-32.75
w=47.25
w=127.25
B_u (G)
B_v (G)
B_w (G)
v (cm)
w=207.25
w=287.25
w=367.25

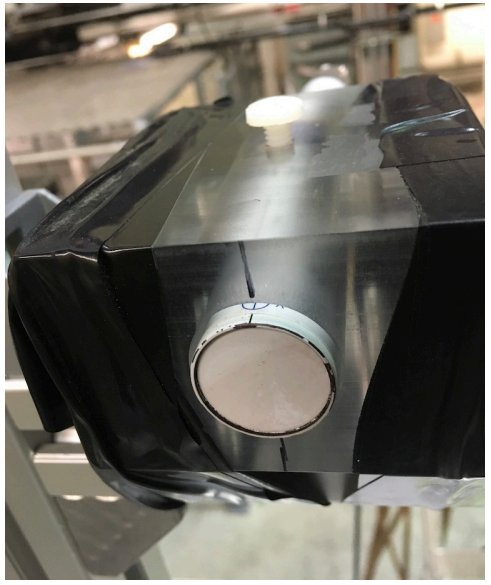
Limitations/issues

- The grids were marked in reference to the platform frames
- The probe was aligned using the markers on the probe
- Spatial uncertainties:
  - Translational uncertainty < 5cm
  - Alignment is critical, but we don't have a good estimate

  -> Will be good to have a global reference
- The floor is not flat



- The yellow and grey toolboxes magnetic are slightly magnetic



Next

- The line u=40cm was marked but not used due to spatial limitations

  -> mark 20cm grid in between and scan

- Somehow estimate the angle uncertainties