

Magnetic Field Mapping - Quick Update

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Survey Data

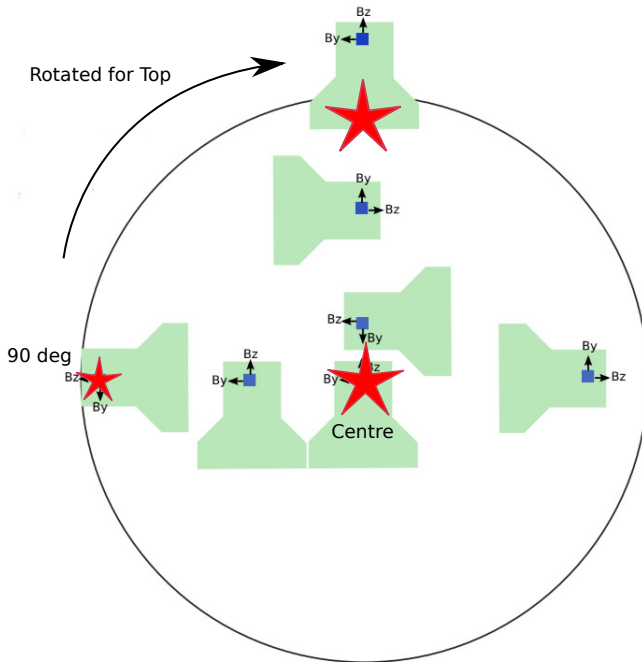
I now have the Survey data from the field mapping work!

Three Surveys were done for SSU and SSD where the survey target was at:

- The centre probe position of the mapper.
- The 2nd outermost probe, $r = 0.15\text{m}$, at the vertical ($z \sim 0.15\text{m}$, $y \sim 0\text{m}$)
- As above but at 90° ($z \sim 0\text{m}$, $y \sim 0.15\text{m}$)

All survey's were done using the same .grid file for the mapper.

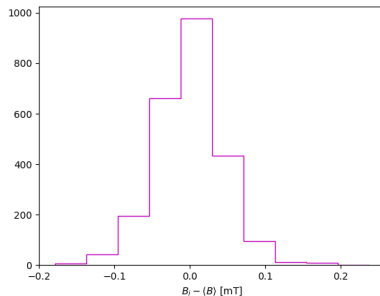
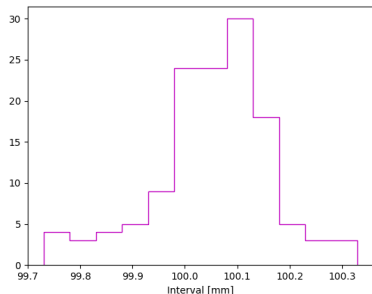
Straight through run, 44 steps of 100mm from 10mm to 4410mm in mapper coords.



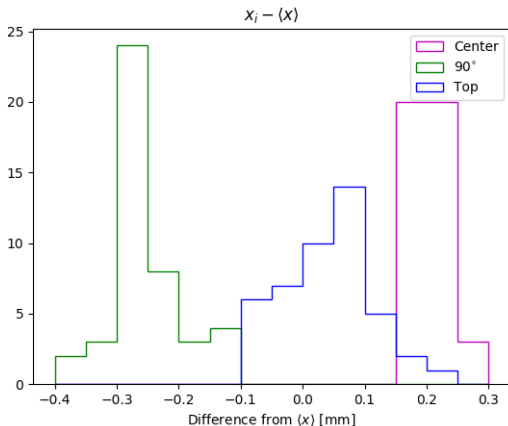
Survey Data

First thing is to check how repeatable the longitudinal coordinate of the mapper is.

All runs are done using the same grid so we can check the survey data to see how close to 100mm the interval between points actually is.

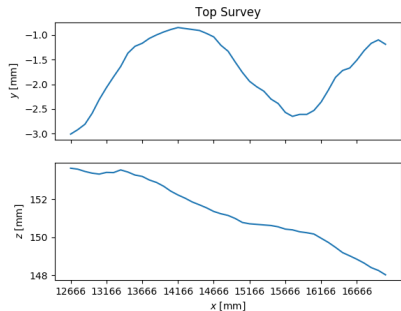
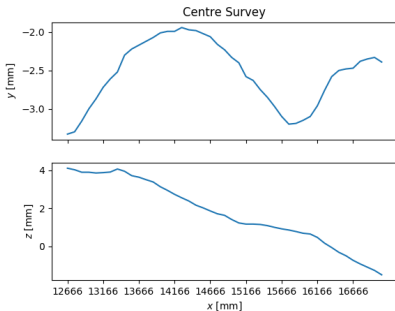


Using the data from the three runs with the survey target at different ϕ positions, we can look at how tilted the mapper disk is.

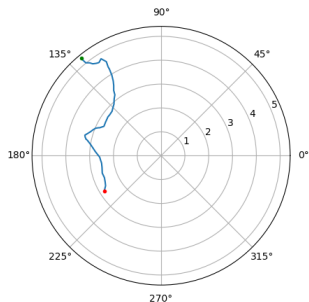
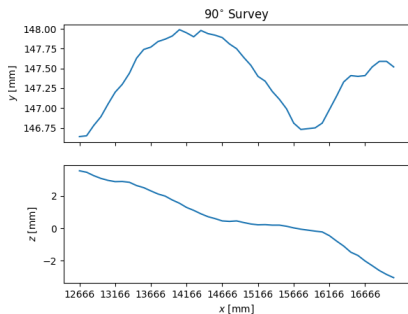


The mapper disk is actually fairly orthogonal to the beamline coordinate ($<0.5\text{mm}$ deviation).

As for the motion of the mapper through the magnet (SSU).



Polar plot shows motion of centre of disk through the magnet. Green is the start, red is the end.



Similar story for SSD, with different shapes.

Next Steps

- Apply survey data to my field maps.
- Obtain survey data with SSU and SSD fiducial markers in situ. This way I should be able to make a field model and compare with the data from the Hall probes on the trackers
- Perform Monte Carlo simulations with my fields in MAUS – It (v3.0.0) does not like the maustext format for some reason so I'm going to try the g4bl3dgrid format (more difficult to implement).