

Magnetic Fields of JGG and Rosie

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- Ziptrack analysis
 - Status of analysis
- B-field in MIPP software
 - Preliminary class added to MIPP-software
 - What needs to be improved

- Magnetic fields in MIPP
 - +0.7 T in JGG (parallel to +y direction, up)
 - -0.6 T in Rosie (parallel to -y direction, down)
 - B-field stability monitored with Hall probes and magnet current
 - Field has been mapped in grid with 2 inch spacing
 - Fringe fields
 - < 10 G at Tof pmt location
 - Larger at pmts of multicell Ckov, problem?

- Analysis status

- Ziptrack Hall-probes calibrated against NMR

- These probes shift their calibration if the weak custom connector between Hall probe cable and readout module is touched (or if the cable is pulled)

- Survey data partly incorporated into field map

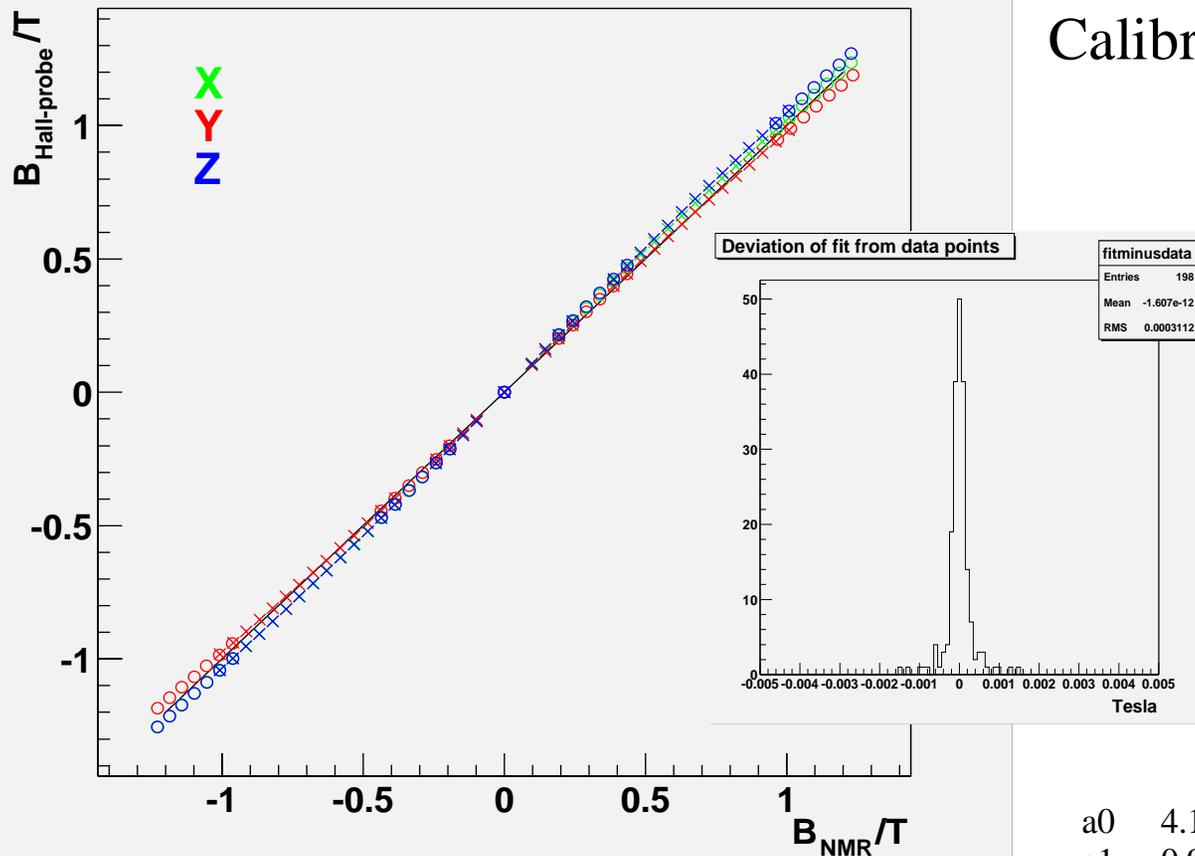
- Software

- In Fortran, inherited from KTeV: Could do a lot of things, but eventually code got to messy (for me)
 - In C++, from scratch: Well structured, better interactive exploration of data, but initially had to invest some time to recreate what I did in Fortran

- Good progress, but no final result yet

- Some other work (hardware installation) had higher priority.

Ziptrack Hall probe calibration



Calibration of Ziptrack Hall probes

X, Y, and Z Hall probes have been calibrated against NMR in the center of Rosie.

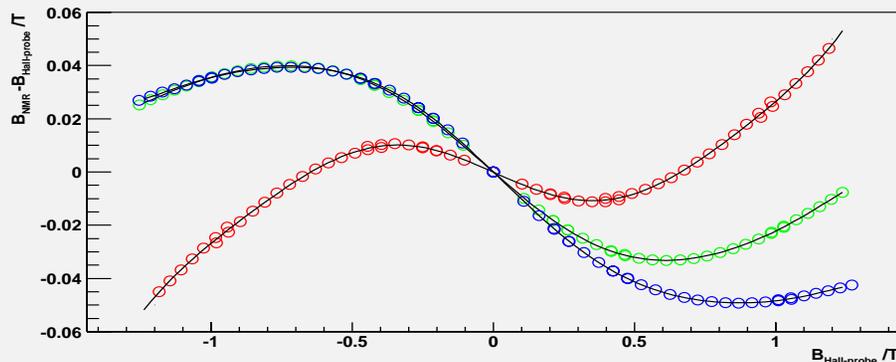
The calibration is limited by the reproducibility of the Hall probes. The connection of the cables to the personality modules in the back of the readout boxes is not good. One way to avoid motion in this connection would be lots of epoxy.

Polynomial fit parameters:

	X	Y	Z
a0	4.16933e-05	-3.39474e-05	6.09399e-06
a1	0.90737	0.952885	0.898097
a2	0.00839644	-0.00289059	-0.011772
a3	0.117158	0.156021	0.119193
a4	-0.00238013	0.00527768	0.00866419
a5	-0.0876168	-0.131081	-0.100713
a6	0.00083687	-0.00346895	-0.00432469
a7	0.043501	0.0579032	0.0530167
a8	-0.000212094	0.000944977	0.000976218
a9	-0.00929848	-0.00909168	-0.0115372

$$B_{true} = a_0 + a_1 B_{hall\ probe} + a_2 B_{hall\ probe}^2 + \dots$$

Ziptrack Hall probe calibration



- MIPP software:
 - MC (fortran) and everything else (C++)
- MC has routines to access B-field:
 - Uses old fieldmaps
 - Separate routines for JGG and Rosie
 - One small bug in Rosie interpolation routine (fixed)
- C++ code now has Bfield class added:
 - Contains preliminary B-field (different from MC)
 - Preliminary, but working code
- Future improvements (my To-Do list)
 - Make final B-field maps for both JGG and Rosie
 - Store maps in DB rather than text files
 - Get the MC to use the new maps
 - Add methods to the Bfield class to access field in MIPP coordinate system
 - ???