

First look at GEM-DCH matching for SRC

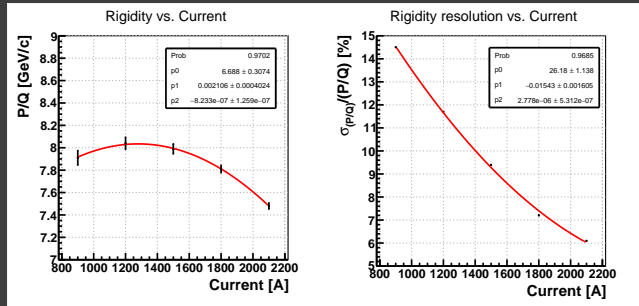
Sergei Merts

Weekly BERS group meeting

15/03/2019

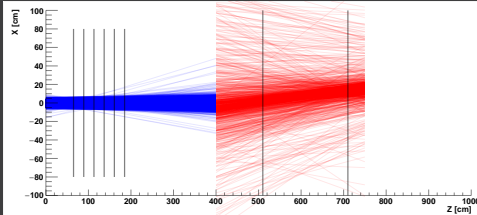


- Match **GEM** and **DCH** tracks
- Estimate **magnetic field effect** on quality of matching
- Take this effect into account and **improve quality** of momentum reconstruction

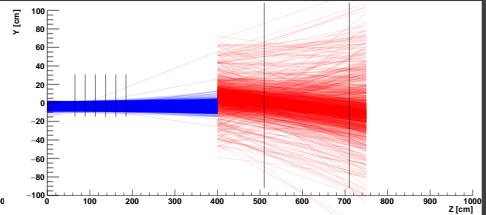


Reminder: some problems with DCH coordinates

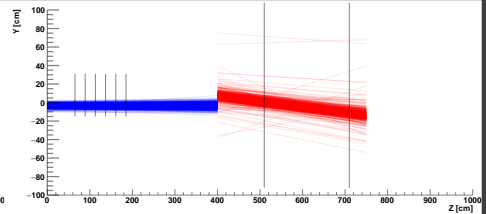
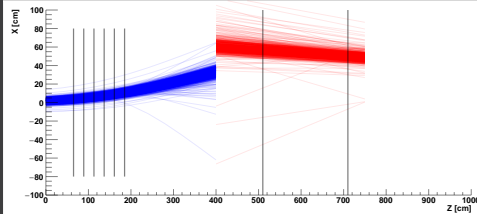
ZX



ZY



2320



2332

Algorithm to be used for DCH global alignment

- ① Propagate **GEM** and **DCH** tracks on **$z = 400$ cm** (w/o mag.field)
- ② Estimate mean of correlated peak for $dt_{x|y} = t_{x|y}^{GEM} - t_{x|y}^{DCH}$. (All-to-all)
- ③ Correct t_x and t_y for DCH tracks (**not GEOMETRY!**)
- ④ Propagate again and estimate mean of correlated peak for $dX = X^{GEM} - X^{DCH}$, $dY = Y^{GEM} - Y^{DCH}$. (All-to-all)
- ⑤ Correct **X** and **Y** for DCH tracks (**not GEOMETRY!**)
- ⑥ Propagate for runs **with mag.field** and estimate dX and dt_x for each current on magnet

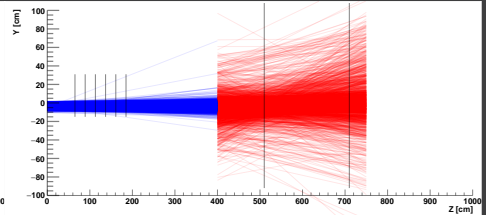
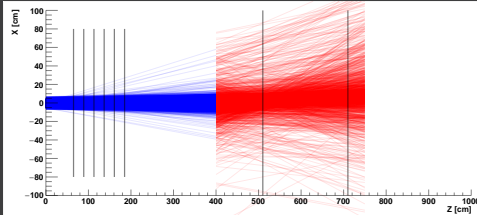
Runs to be analyzed:

Run	2322	2325	2327	2332	2335
Current [A]	900	1200	1500	1800	2100

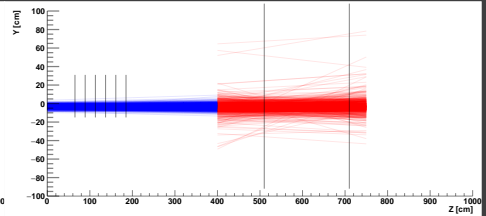
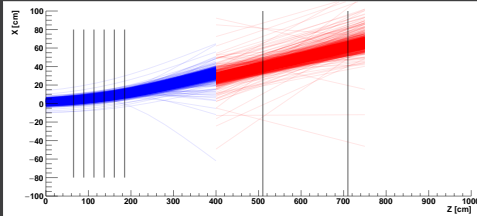
DCH alignment result

ZX

ZY



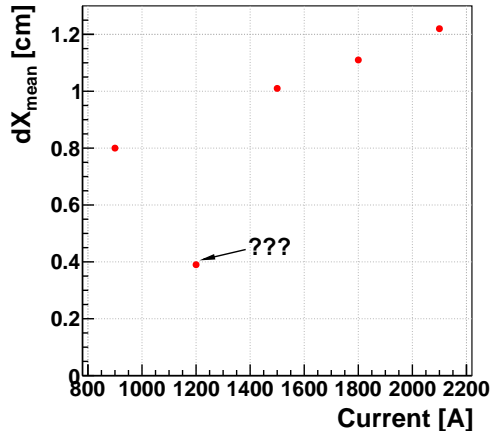
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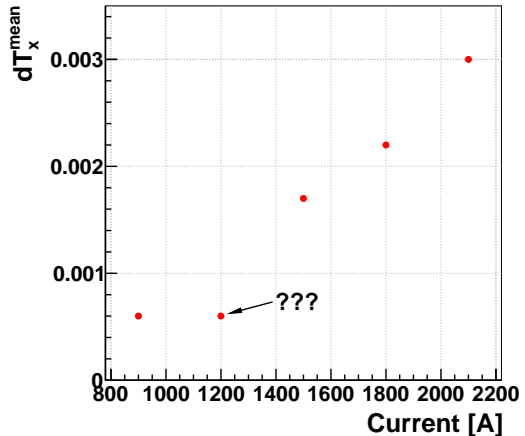
2332

Correlation between Hall sensor voltage and current

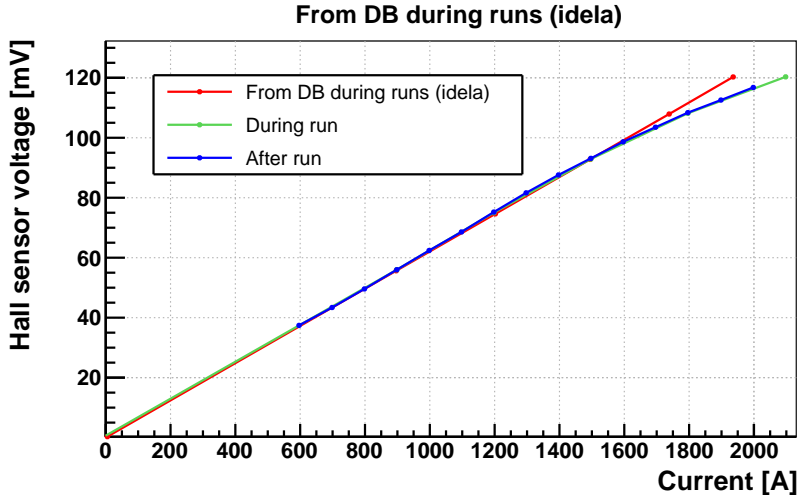
Mean X-shift vs Current



Mean T_x -shift vs Current



Correlation between Hall sensor voltage and current



- Global alignment for DCH was done
- Some strange behavior for $I = 1200$ A was observed
- Effect of magnetic field is present and should be taken into account (Next step)
- TOF-700, CSC and Si should be used to check alignment and magnetic field effect