Resolution and Focal Plane Patterns in SHMS

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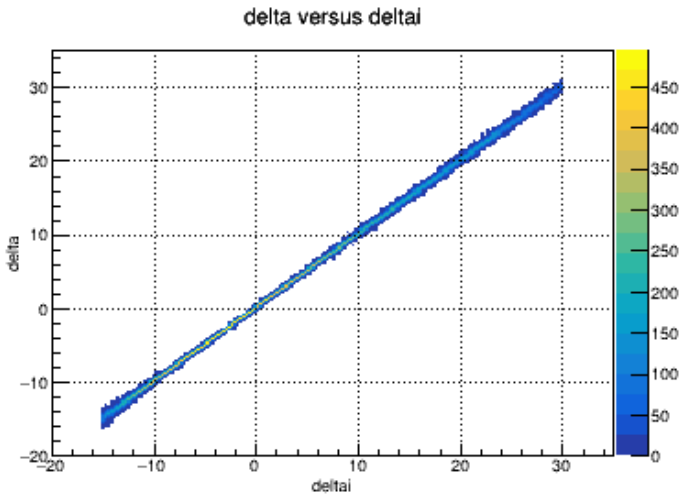
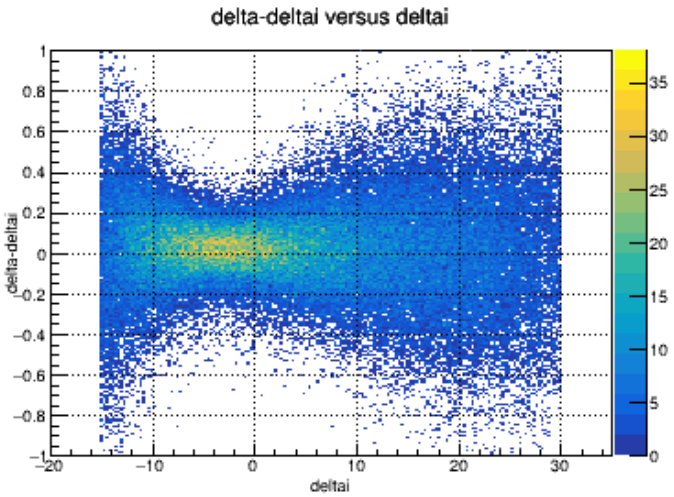
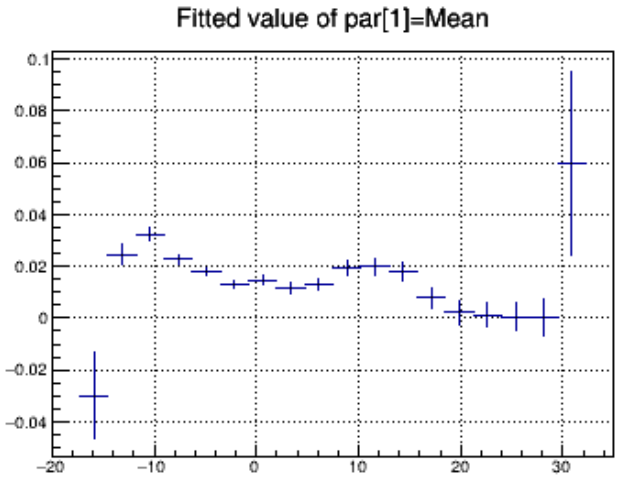
May 12, 2016

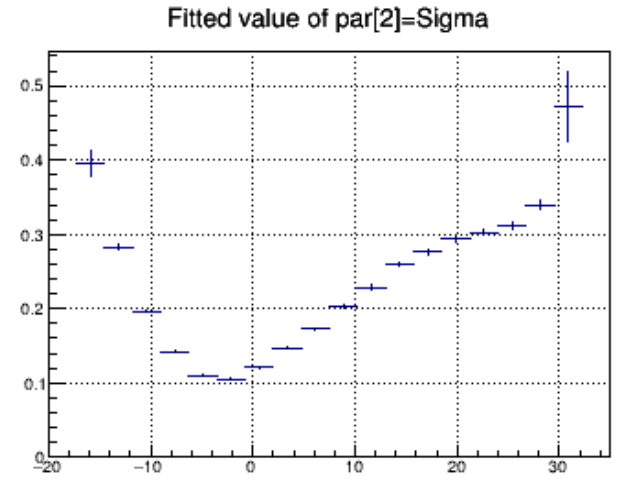
Reconstruction Resolution – 1a

- pointtarg_20deg_2gev_wc_msct_cer_sieve
- delta



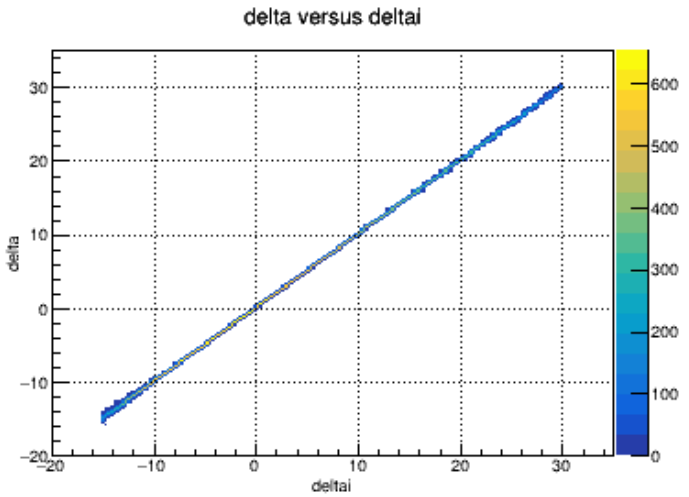


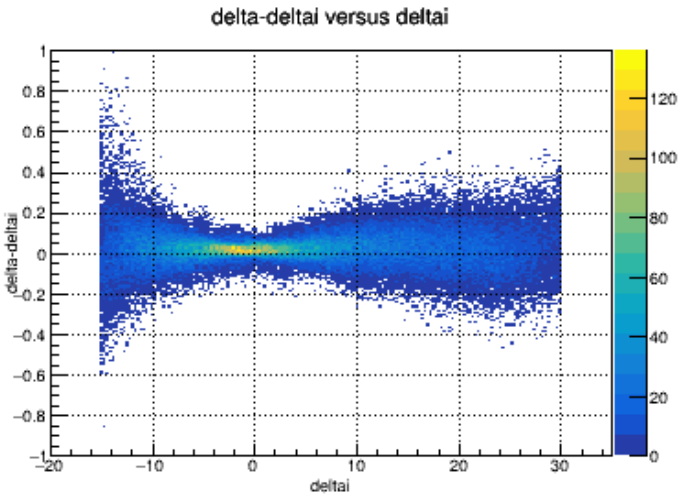


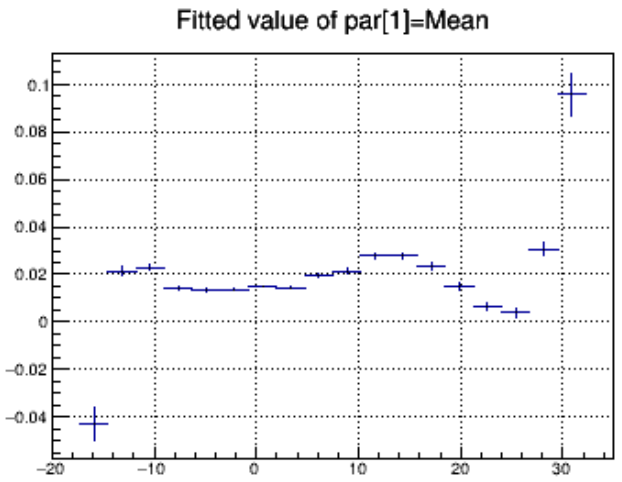


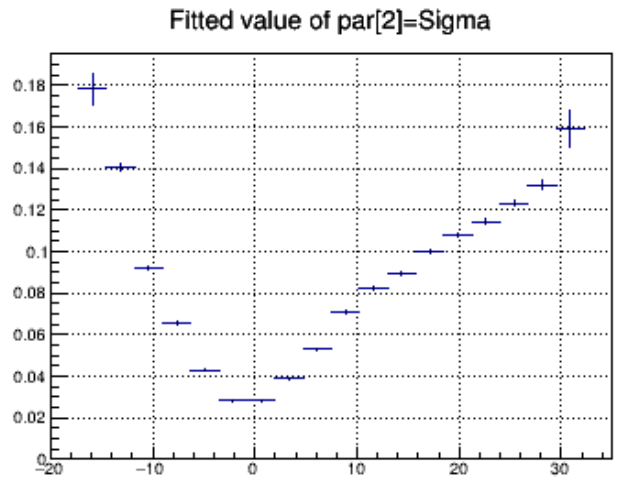
Reconstruction Resolution – 1b

- pointtarg_20deg_2gev_wc_msct_vac_sieve
- delta



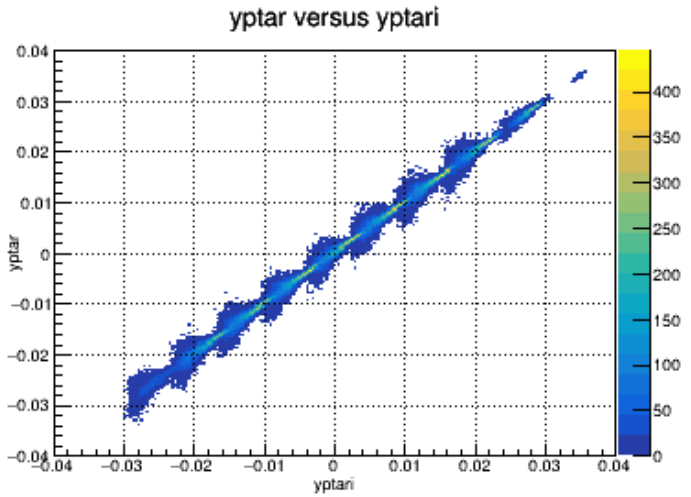


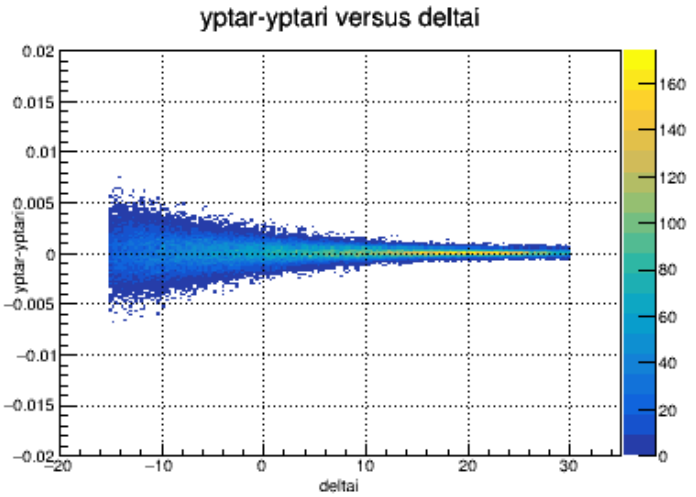


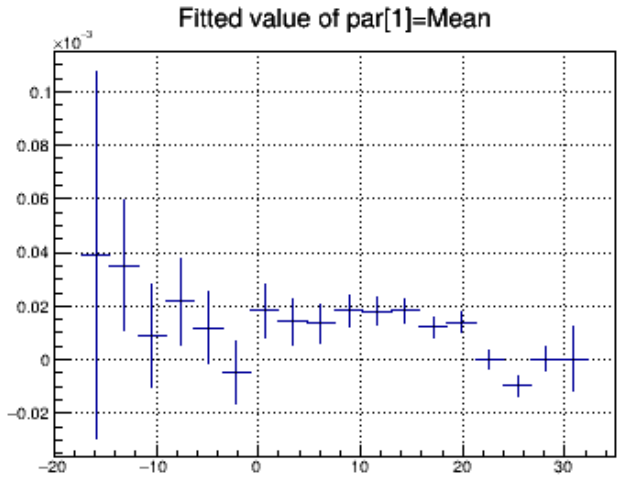


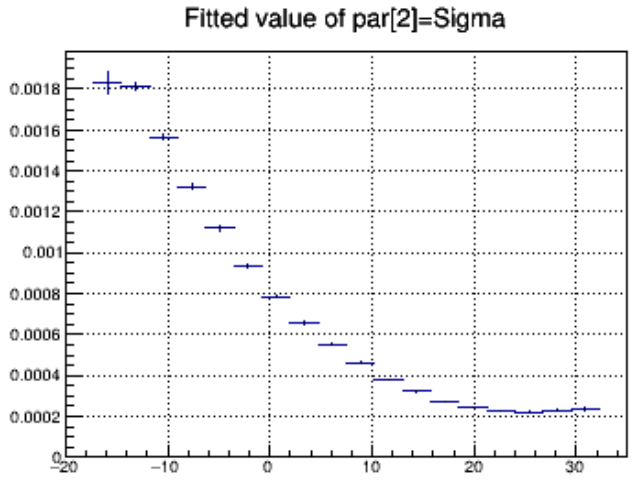
Reconstruction Resolution – 2a

- pointtarg_20deg_6gev_wc_msct_cer_sieve
- xytar



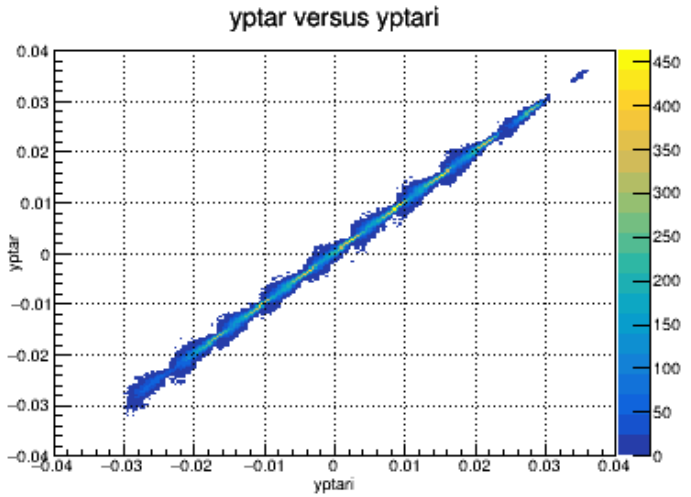


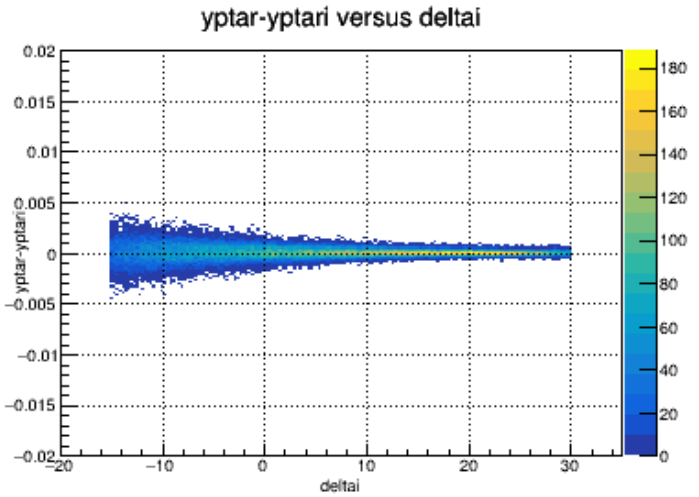


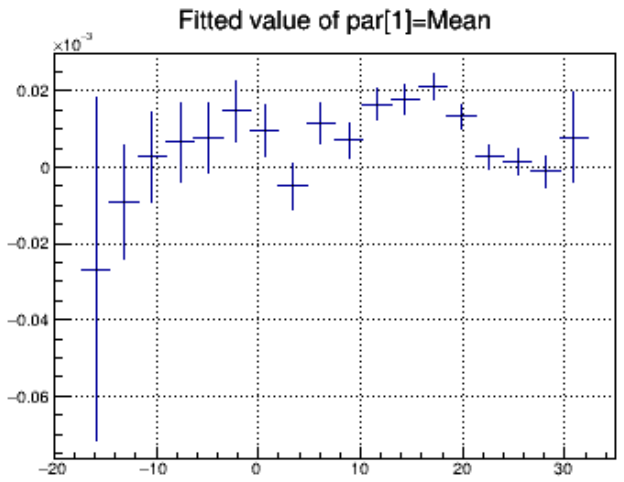


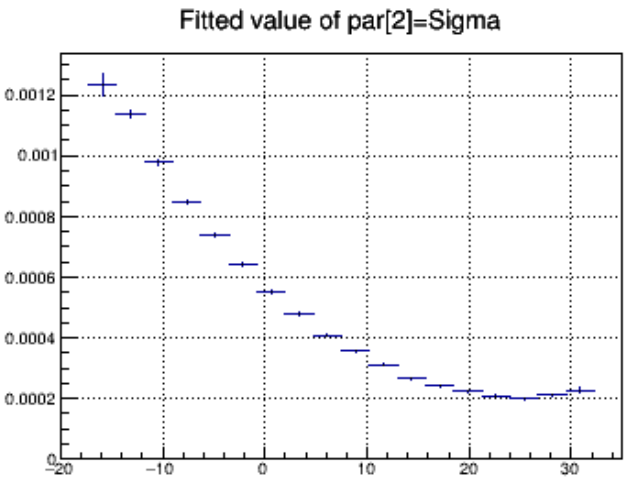
Reconstruction Resolution – 2b

- pointtarg_20deg_6gev_wc_msct_vac_sieve
- xytar







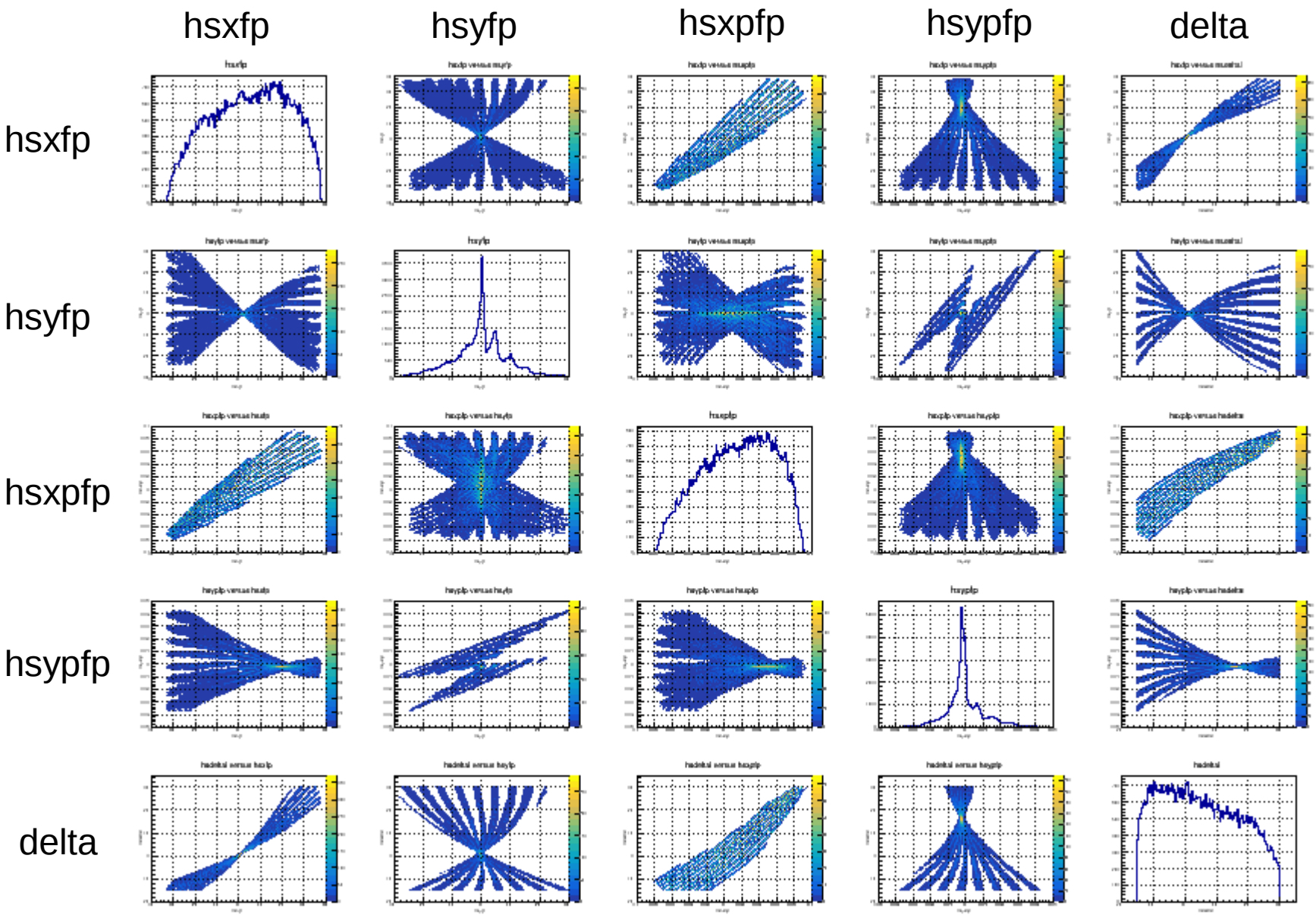


Focal Plane Patterns

- pointtarg_20deg_6gev_wc_msct_vac_sieve

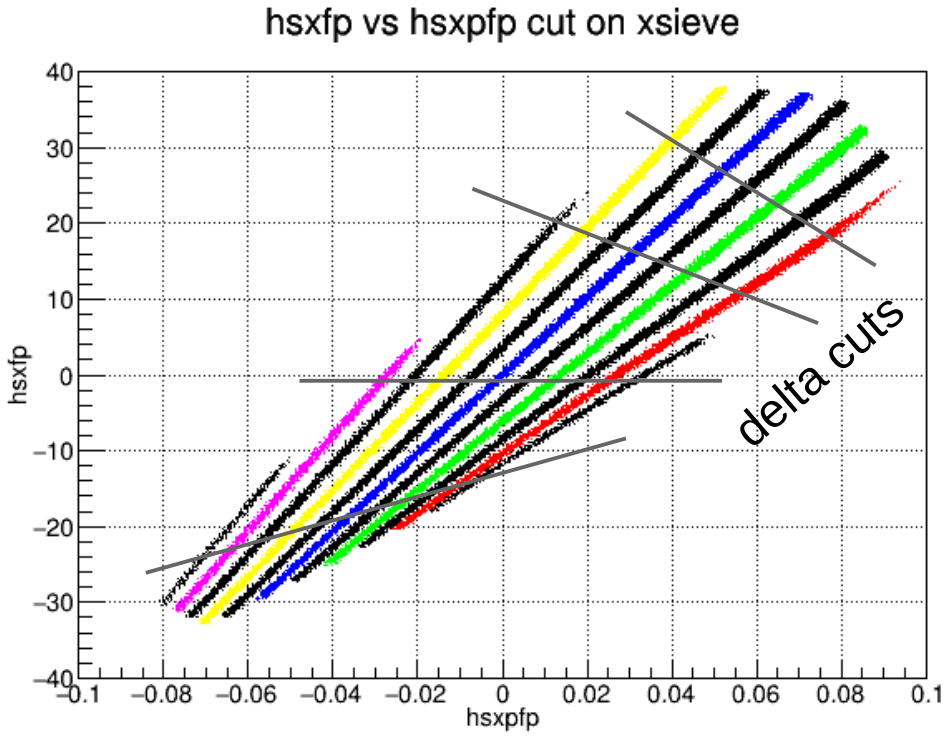
- Study of the patterns in focal plane variables
- What can we expect?
- Can we use them for calibration?

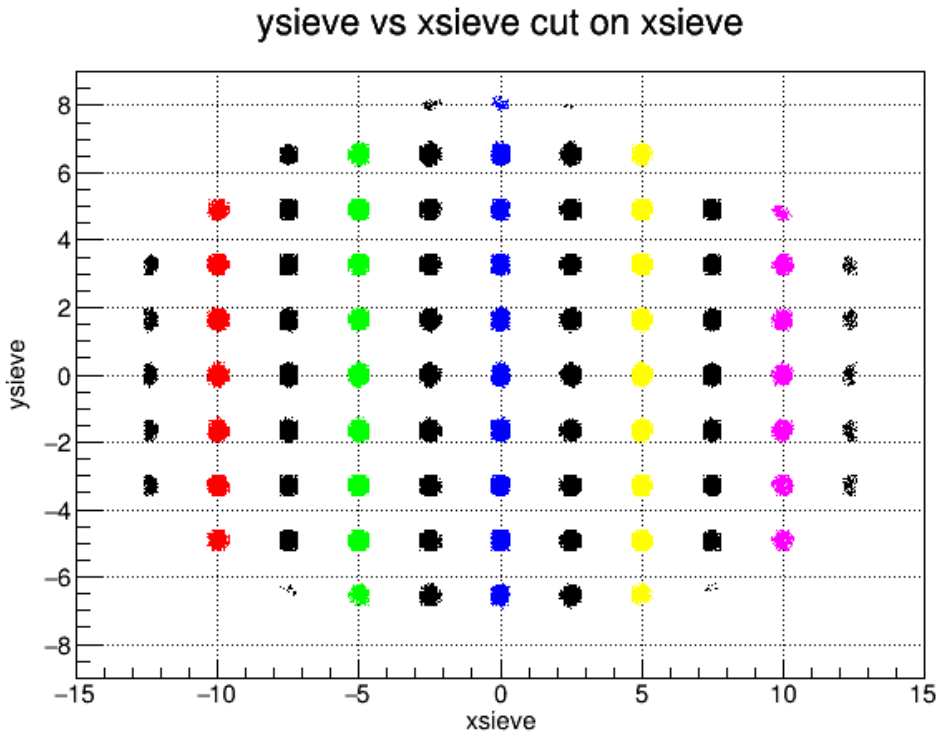
Overview


hsxfp
hsyfp
hsxpfp
hsypfp
delta
hsxfp
hsyfp
hsxpfp
hsypfp
delta

Sieve Holes – xsieve

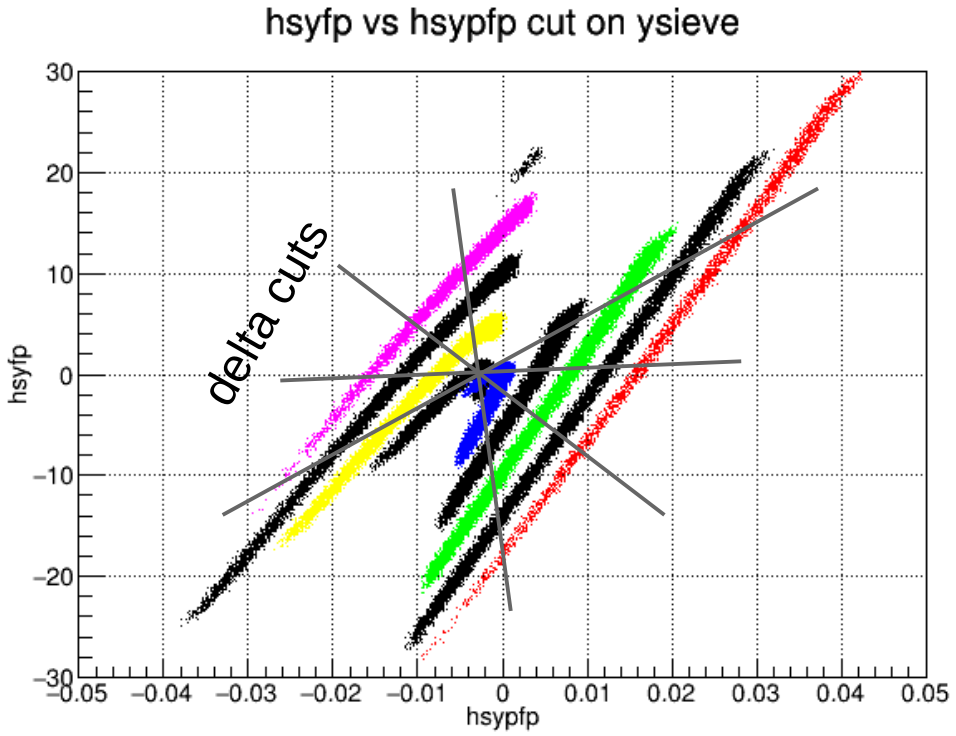
- Select sieve columns with cuts on hsxpfp-hsxfp
- Optional cut on delta
- Not much difference if Cerenkov or vacuum

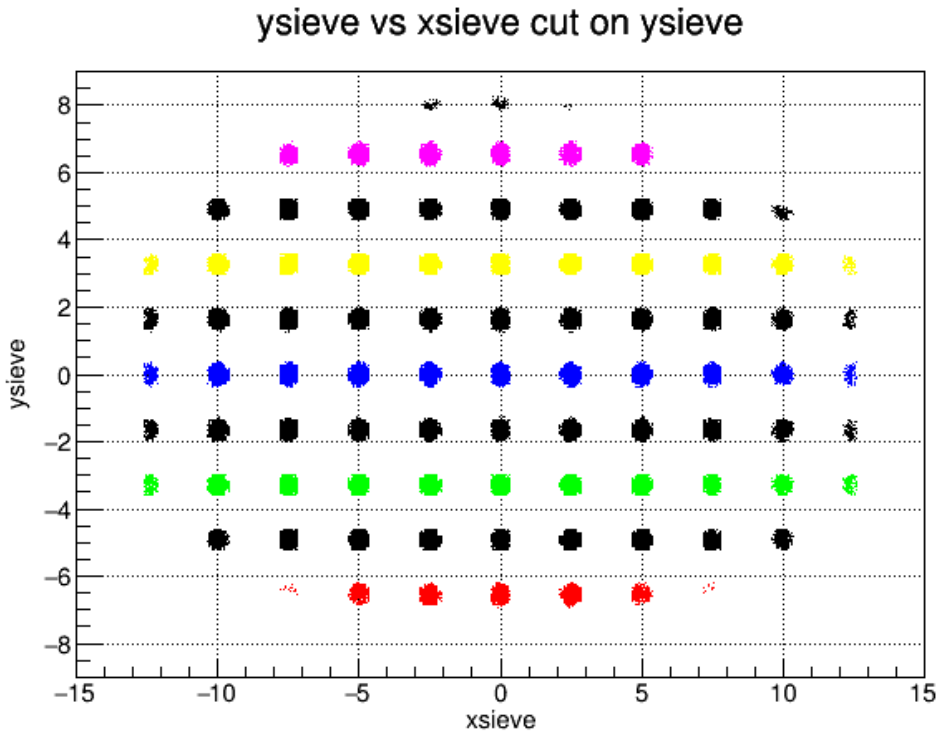




Sieve Holes – ysieve

- Select sieve rows with cuts on hsypfp-hsyfp
- Optional cut on delta
- Not much difference if Cerenkov or vacuum





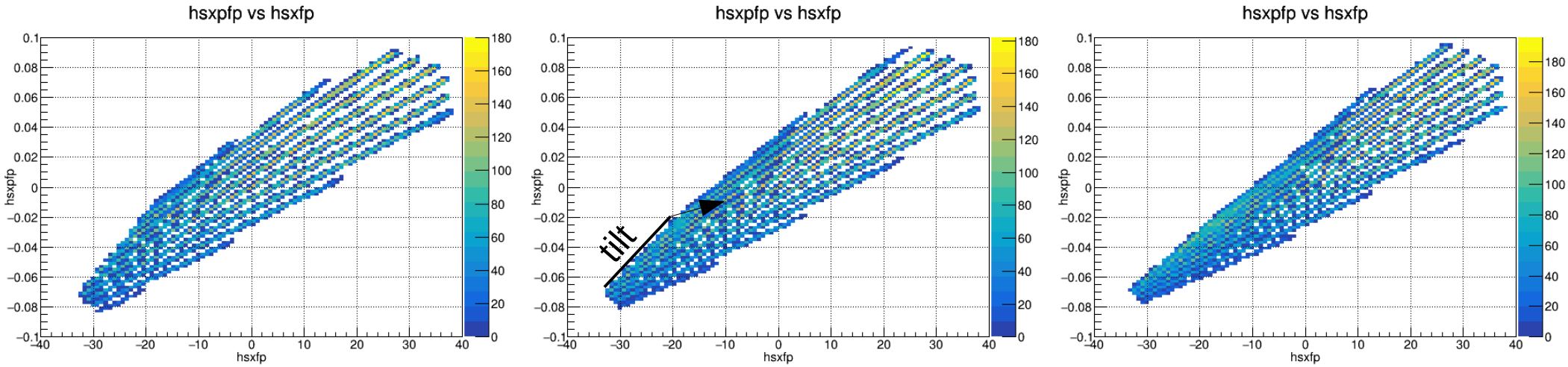
Quad Strength and Focal Plane Patterns

- Can we use focal plane patterns to calibrate strengths of quadrupole magnets?

- Calculated new transport matrices with COSY for different strengths of quads
- Ran mc_shmh_single with new matrices

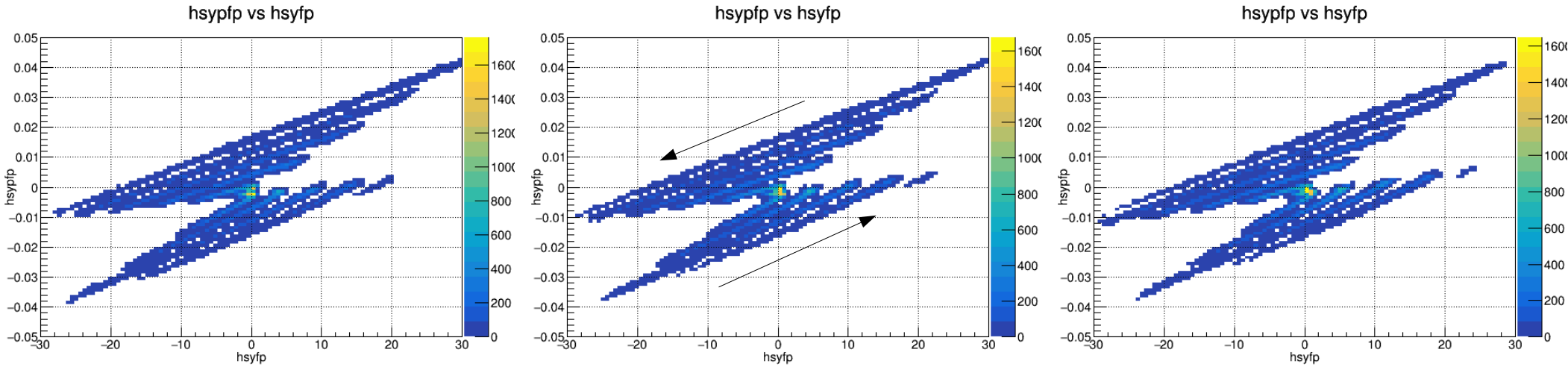
Q1 Strength Variation – 1

- Q2, Q3 on nominal strength
- Q1 [*0.95, *1.00, *1.05] nominal strength



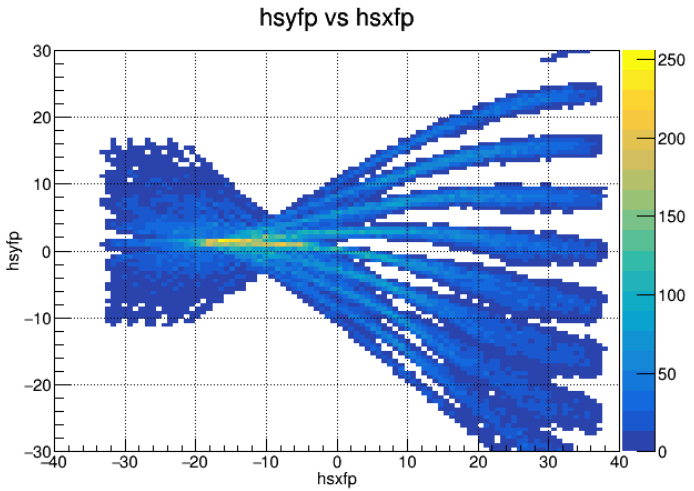
Q1 Strength Variation – 2

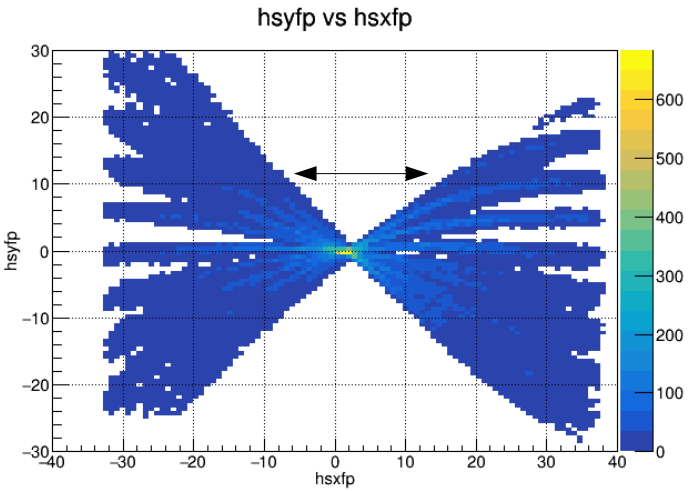
- Q2, Q3 on nominal strength
- Q1 [*0.95, *1.00, *1.05] nominal strength

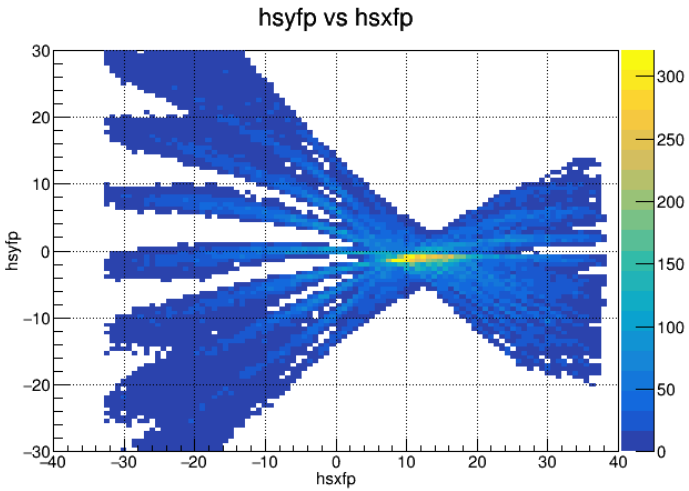


Q2 Strength Variation – 1

- Q1, Q3 on nominal strength
- Q2 [*0.95, *1.00, *1.05] nominal strength

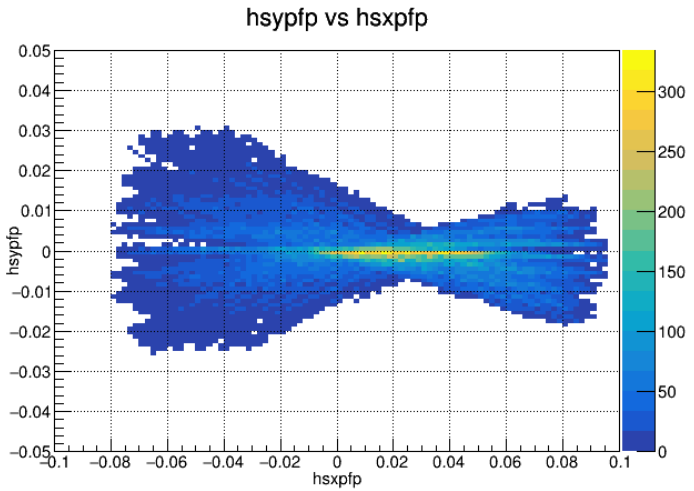


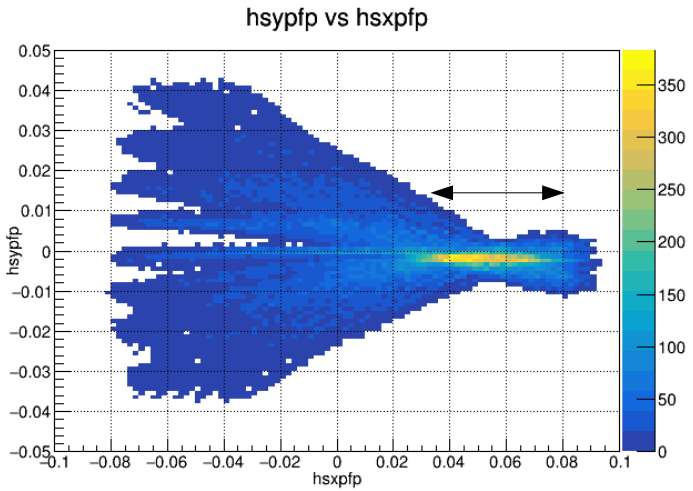


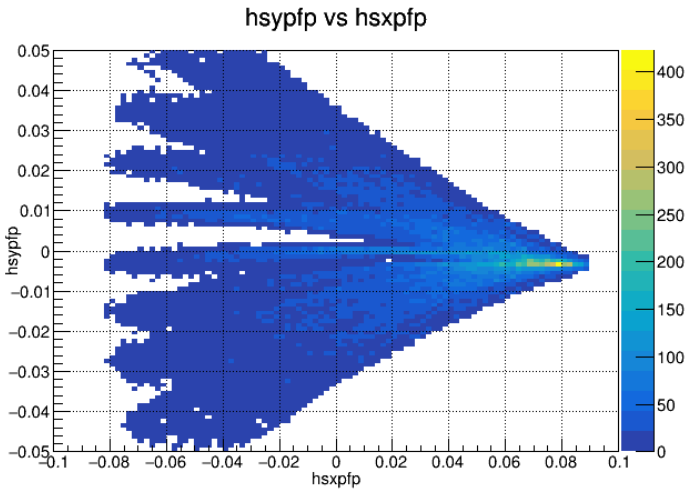


Q2 Strength Variation – 2

- Q1, Q3 on nominal strength
- Q2 [*0.95, *1.00, *1.05] nominal strength

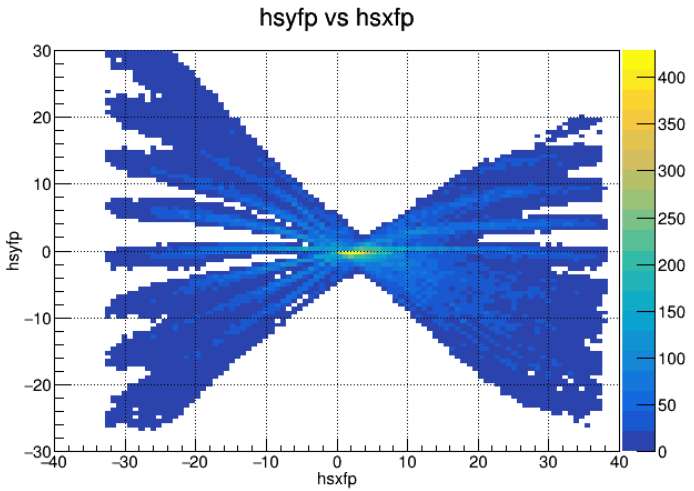


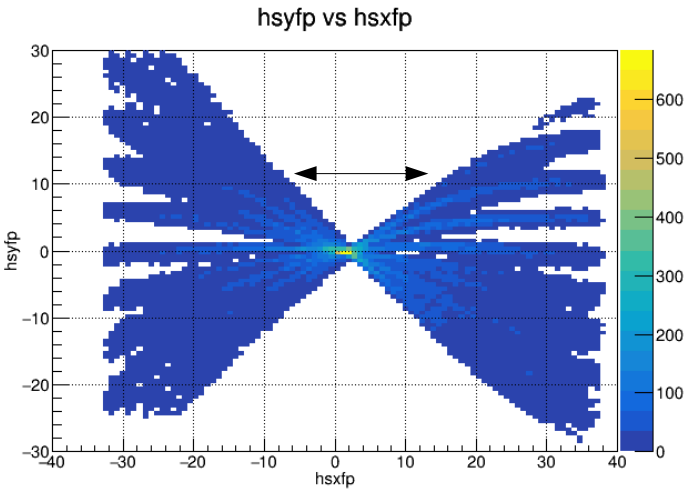


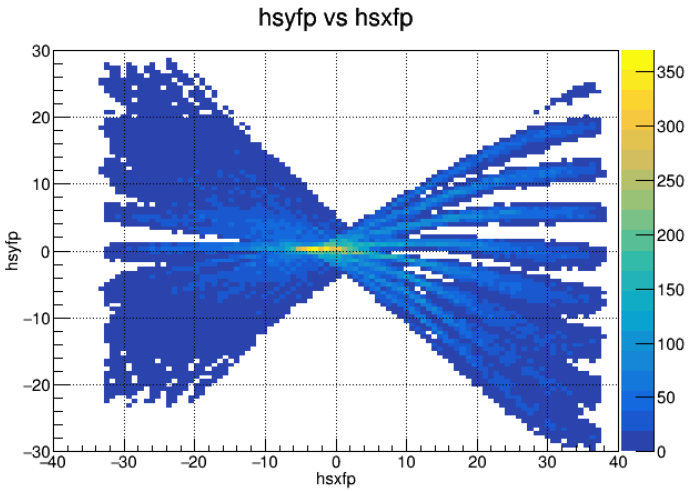


Q3 Strength Variation – 1

- Q1, Q2 on nominal strength
- Q3 [*0.95, *1.00, *1.05] nominal strength

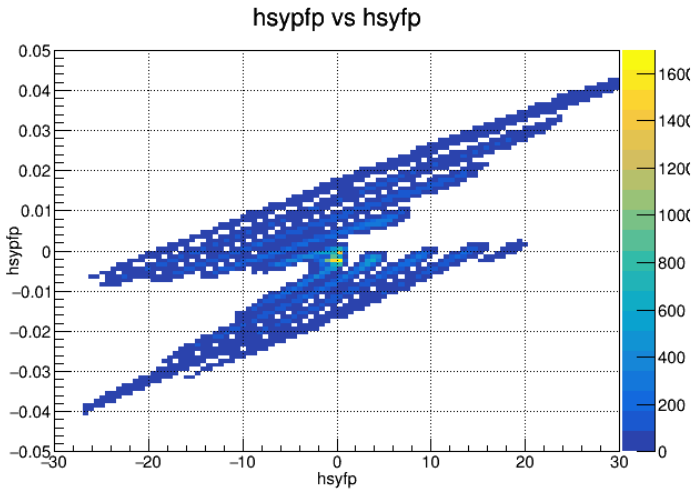


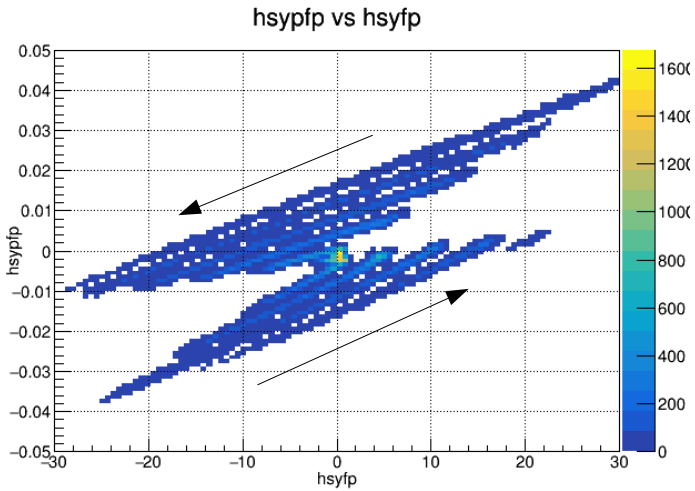


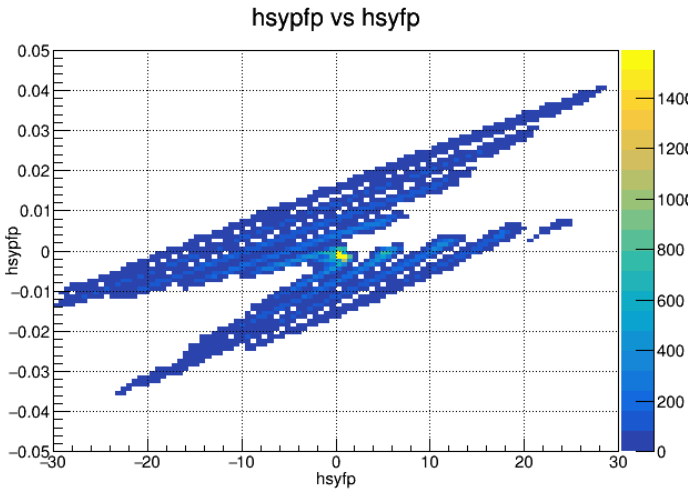


Q3 Strength Variation – 2

- Q1, Q2 on nominal strength
- Q3 [*0.95, *1.00, *1.05] nominal strength





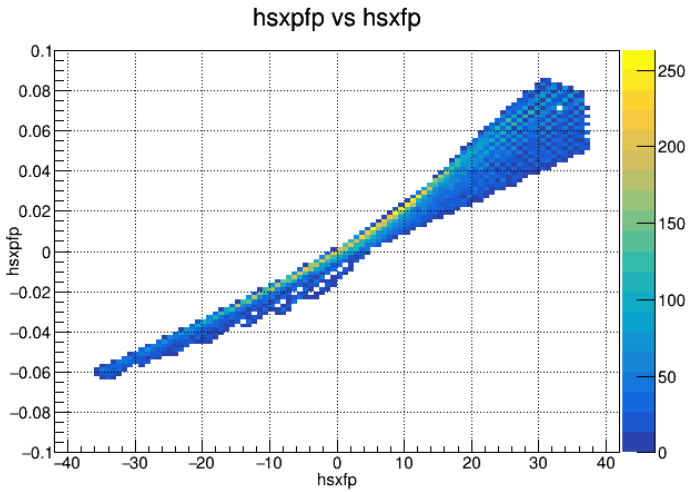


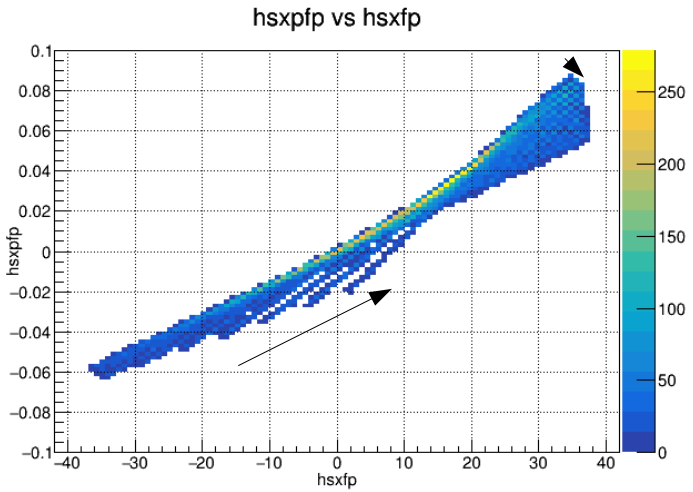
Overview

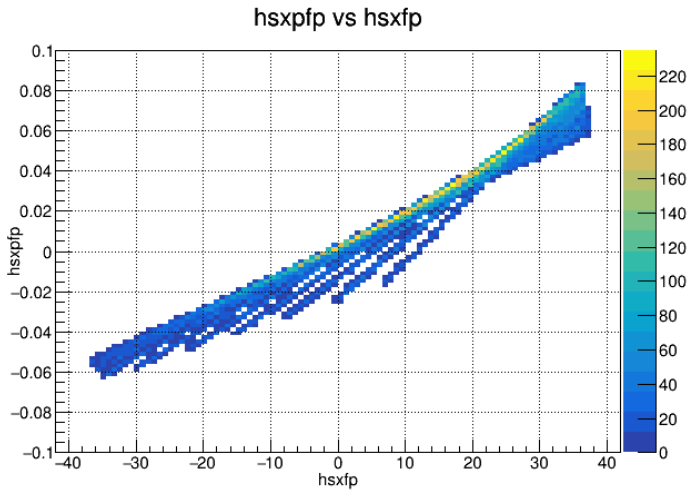
- Patterns not very sensitive to Q1 and Q3
- High sensitivity to Q2
- Hard to disentangle effect of single quad from others
  - All have similar effects on the patterns
  - In first order increasing strength of Q2 is the same as lowering strength of Q1 and Q3
  - Focus in one defocus in other direction
- Try patterns with only single quad powered

Q1 Single Strength Variation – 1

- Q2, Q3 turned off
- Q1 [*0.95, *1.00, *1.05] nominal strength

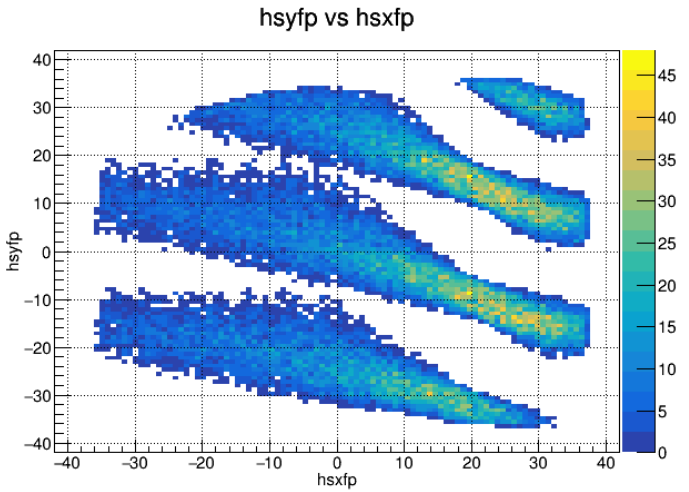


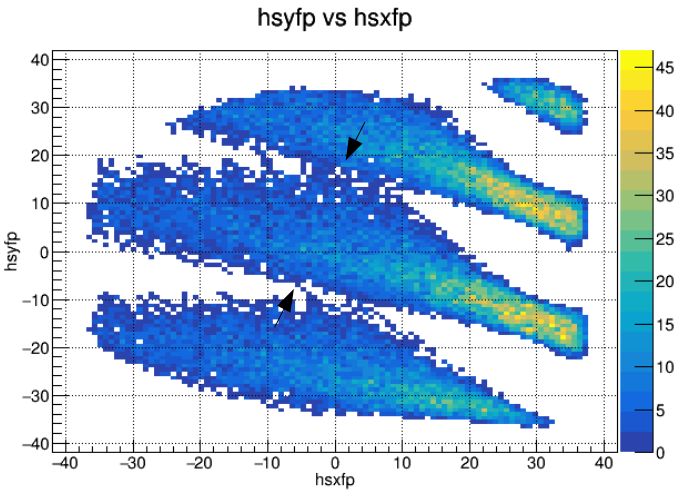


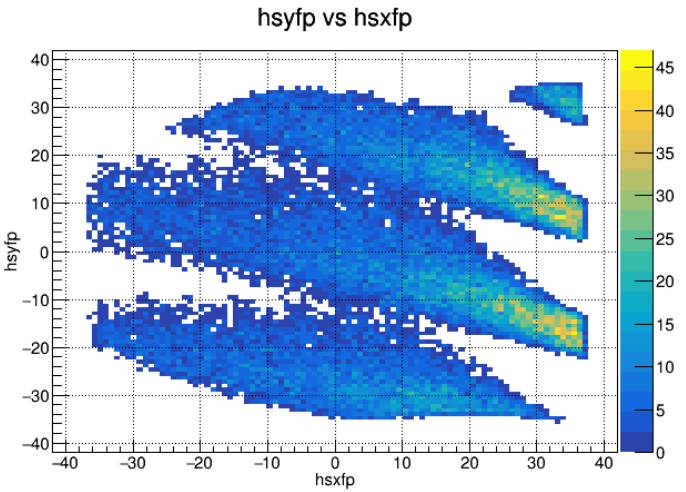


Q1 Single Strength Variation – 2

- Q2, Q3 turned off
- Q1 [*0.95, *1.00, *1.05] nominal strength

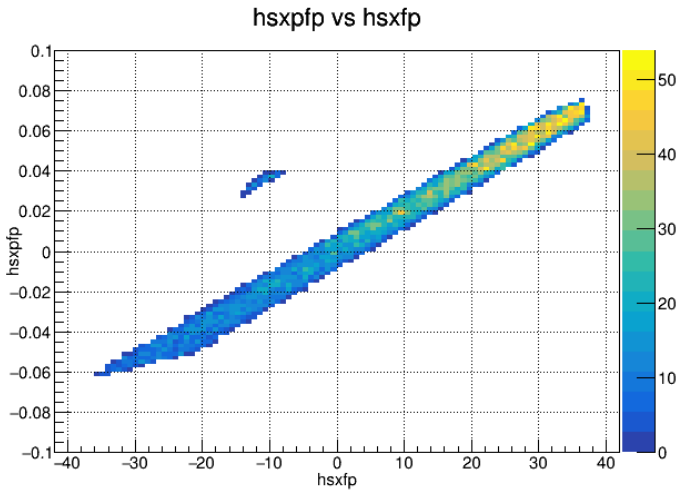


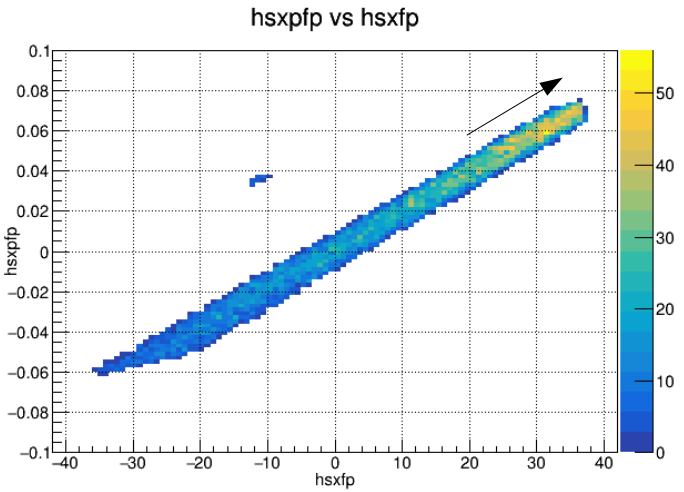


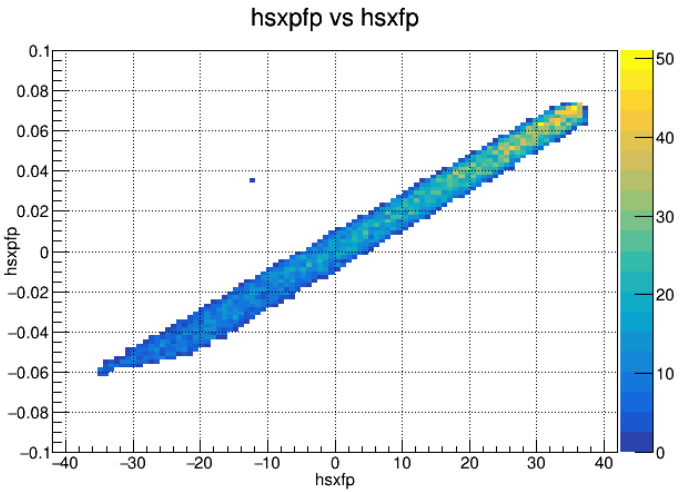


Q2 Single Strength Variation – 1

- Q1, Q3 turned off
- Q2 [*0.95, *1.00, *1.05] nominal strength

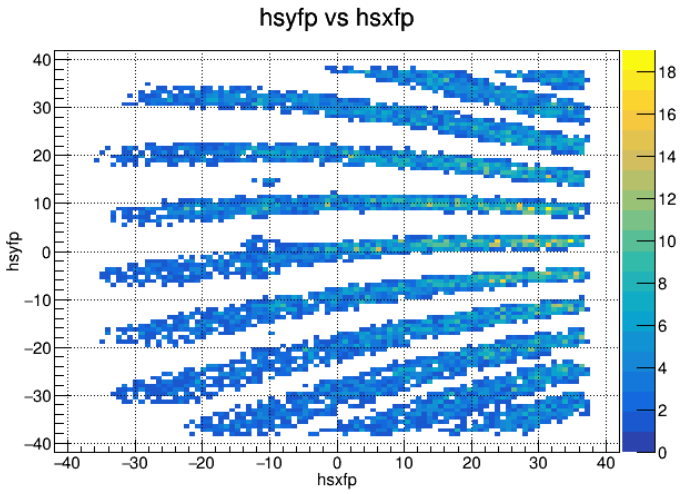


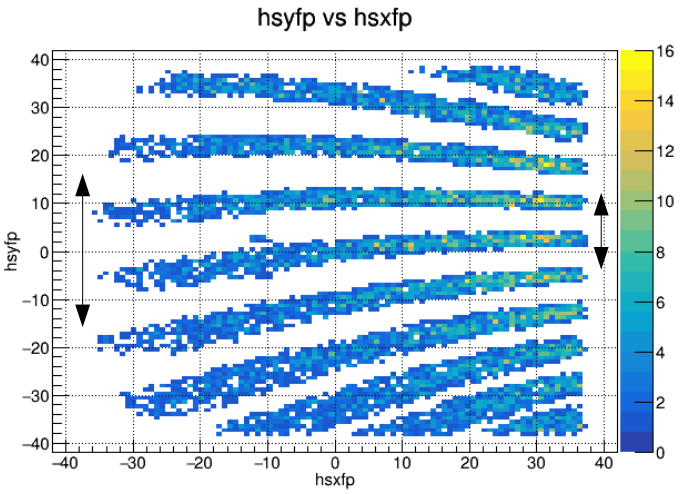


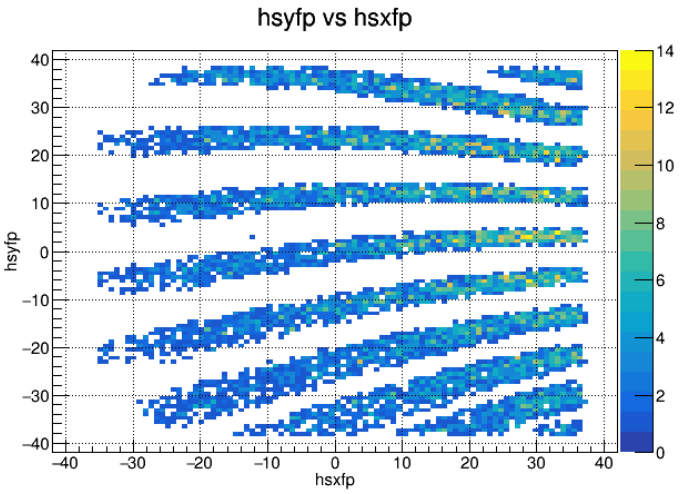


Q2 Single Strength Variation – 2

- Q1, Q3 turned off
- Q2 [*0.95, *1.00, *1.05] nominal strength







Q3 Single Strength Variation

- Q1, Q2 turned off
- Q3 [*0.95, *1.00, *1.05] nominal strength
- 0 < delta < 15