

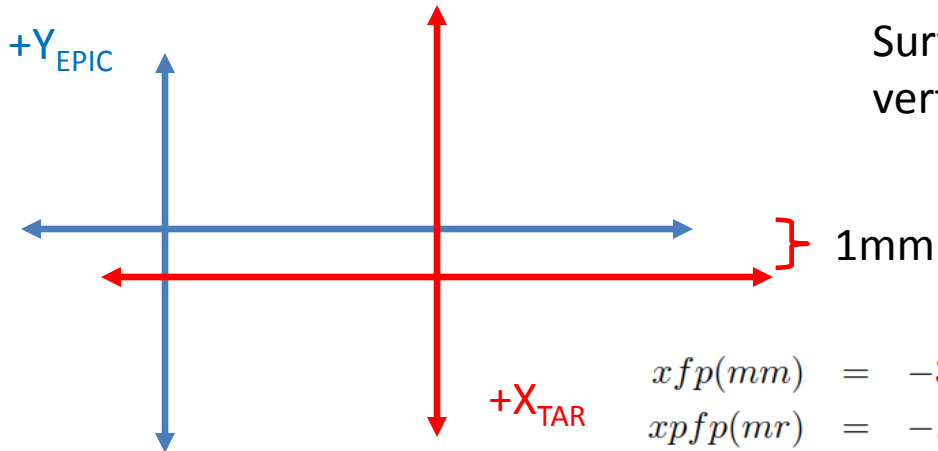
# HMS Focal Plane study

HMS single arm runs with sieve and carbon target. Detect electrons.  
Use Cerenkov and calorimeter to select electrons.

Use the calibration from Dave Gaskell for the BPMs and project to target using BPMA and BPMC. Call these Xbeam\_AC and Ybeam\_AC.

Run	E_beam	P_cent	Th_cent	Xbeam_AC	Ybeam_AC
1136	2221	-1.6	-25	-0.75 mm	3.5mm
1337	6430	-3.2	-22	-0.37 mm	-0.1 mm
1528	10600	-5.816	-18.5	0.03 mm	-0.04mm

# Beam and HMS vertical coordinate systems



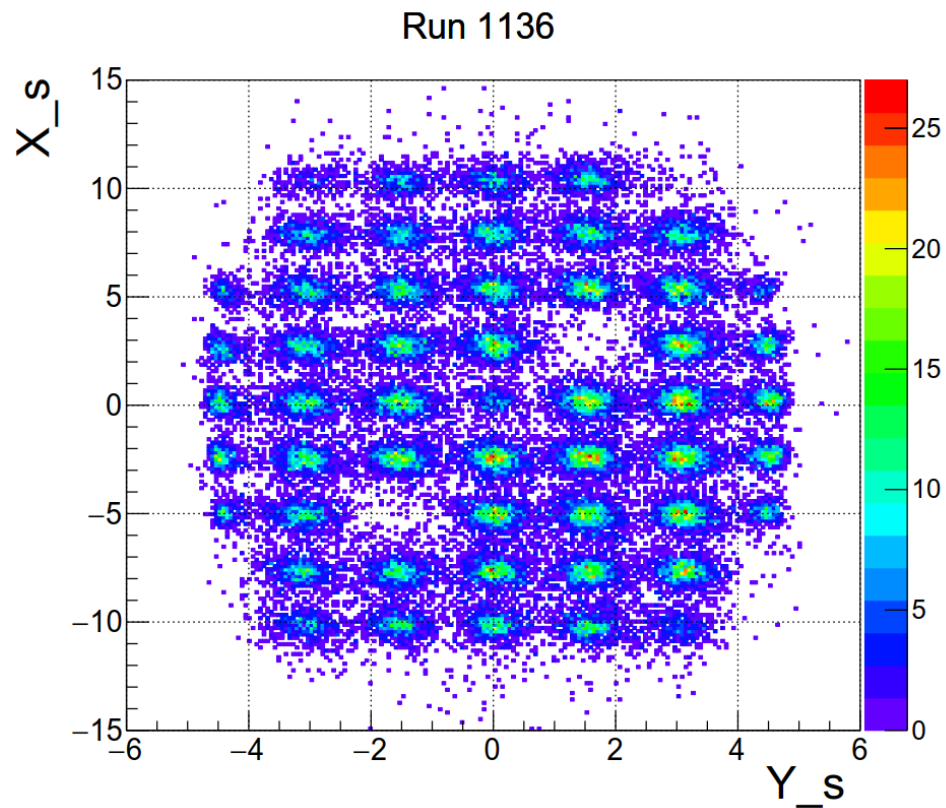
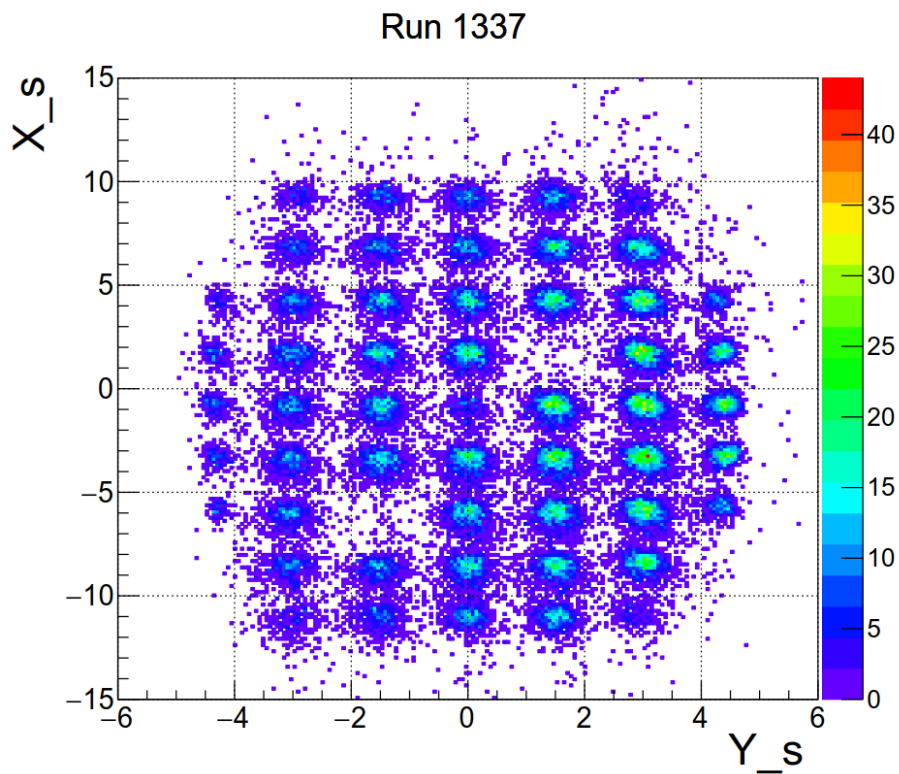
Survey measured HMS optics line is 1mm vertically below the beam line

$$x_{fp}(mm) = -3.41 * x_{tar}(mm) - 0.02 * x_{ptar}(mr) + 37.0 * delta$$

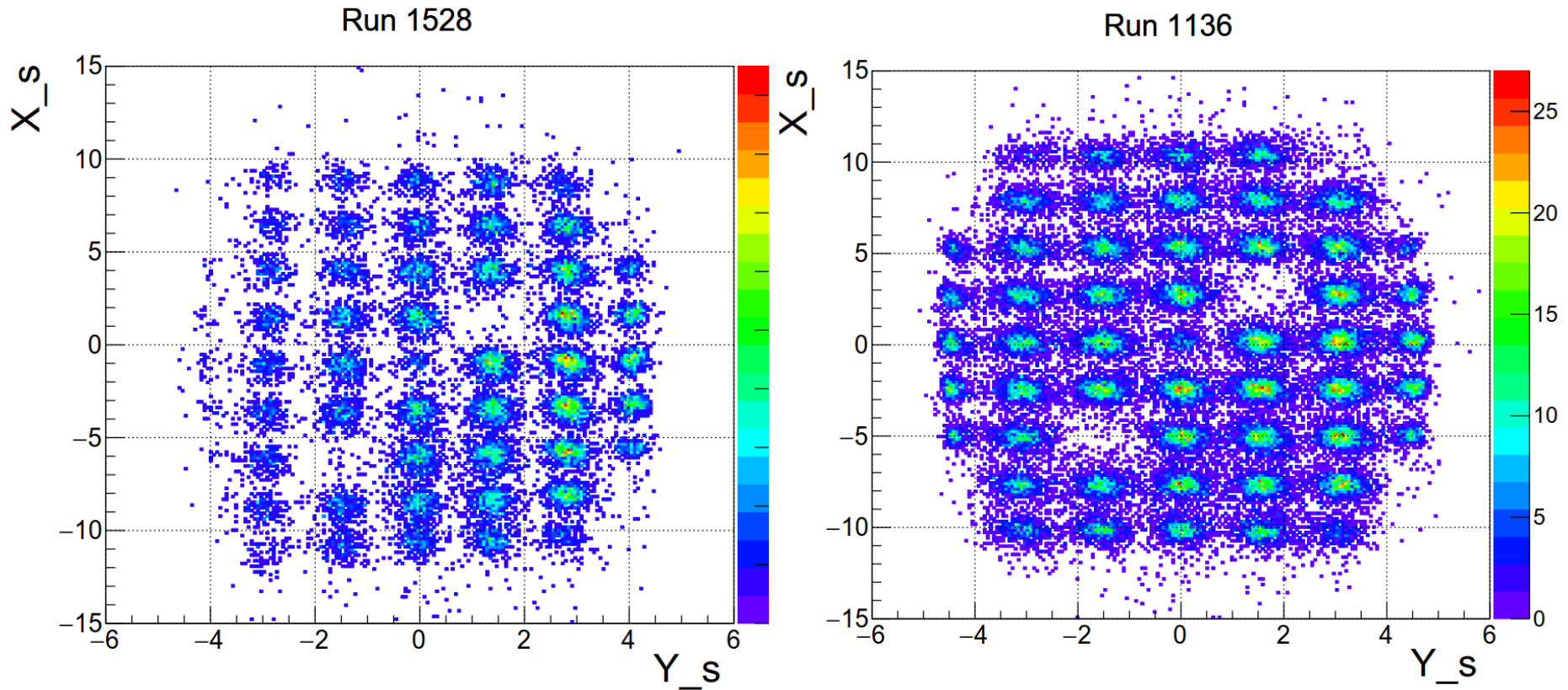
$$x_{pfp}(mr) = -.04 * x_{tar}(mm) - .29 * x_{ptar}(mr) - 0.4 * delta$$

Run	7CY EPICS	Xtar	Xfp
1136	+3.5mm	-4.5mm	+15mm
1337	0mm	-1mm	+3.4mm
1528	0mm	-1mm	+3.4mm

# Xsieve vs Ysieve



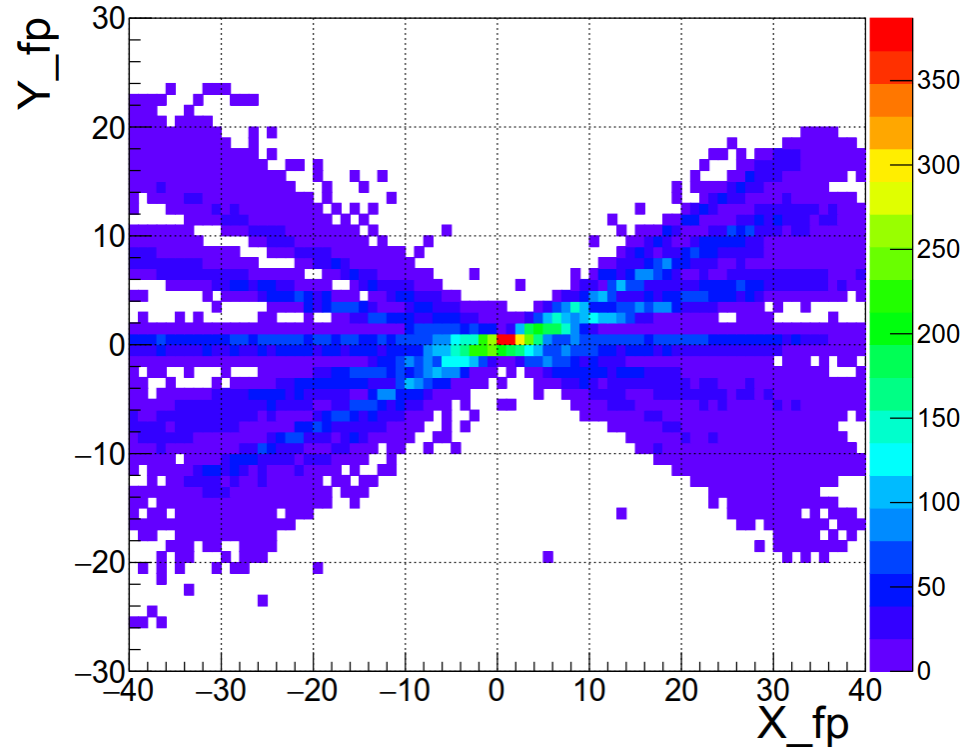
# Xsieve vs Ysieve



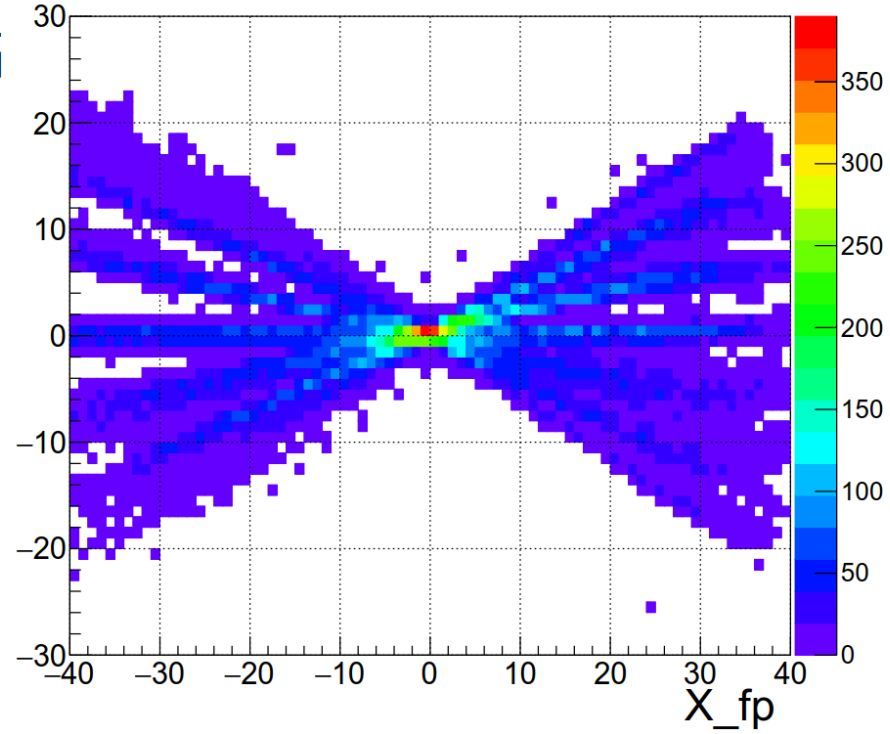
Offset in  $X_{sieve}$  caused by not including the beam position  
 $X_{ptar} = X_{tar}/168$  so expect  $-6mr$  or  $X_{sieve}$  shift of  $-1.0cm$

# Xfp vs Yfp

Run 1337

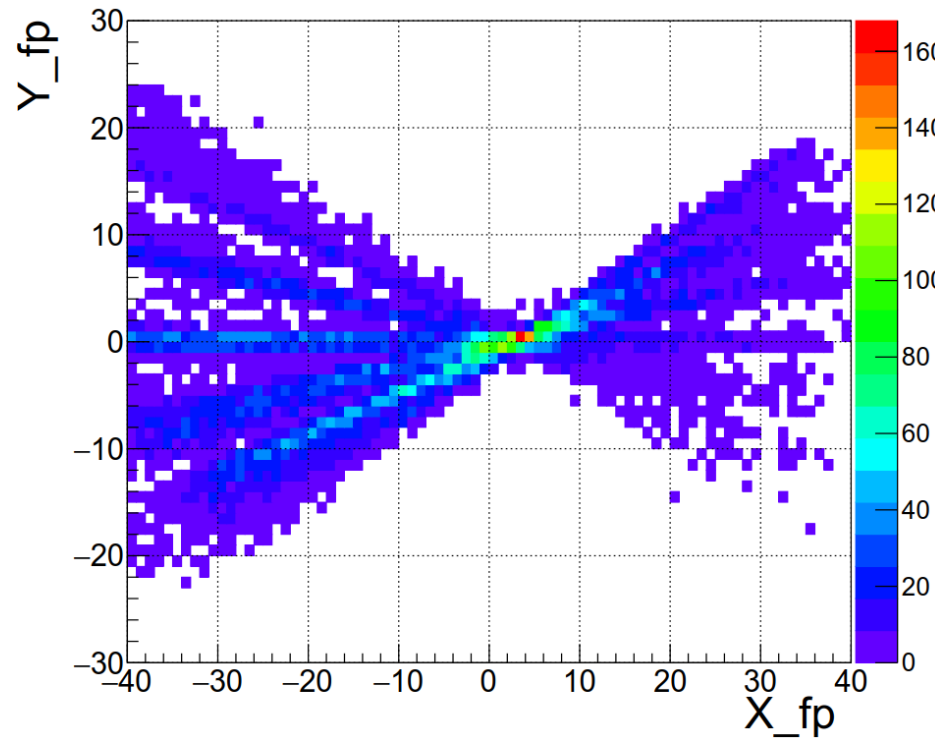


Run 1136

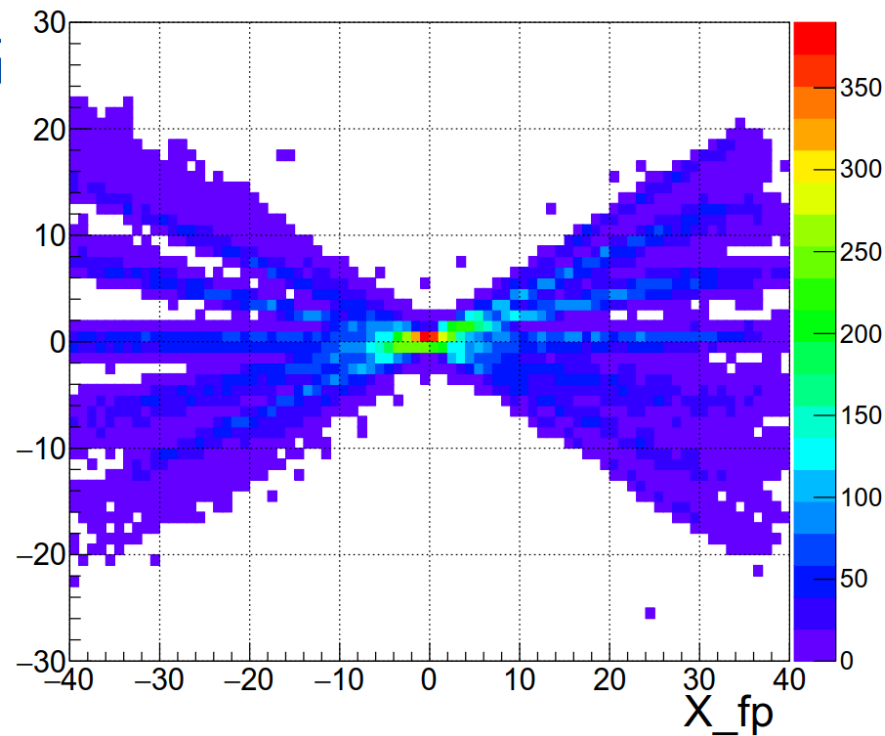


# Xfp vs Yfp

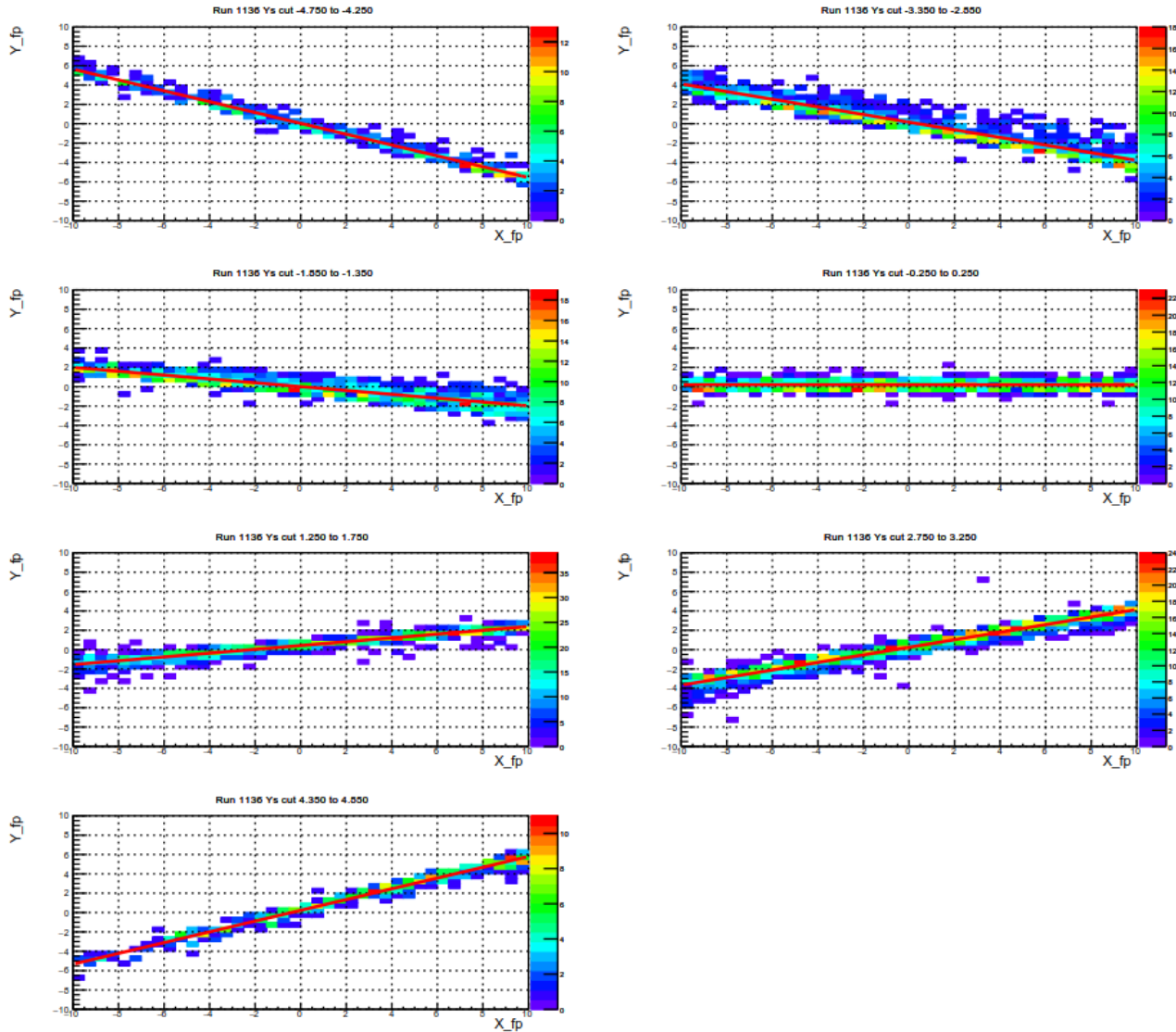
Run 1528



Run 1136

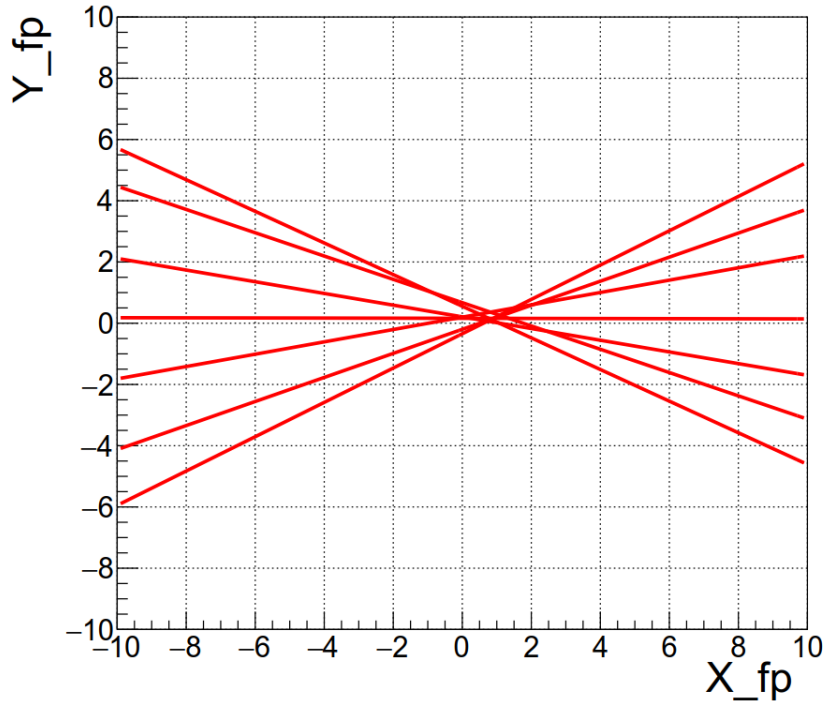


# Fit Xfp versus Yfp

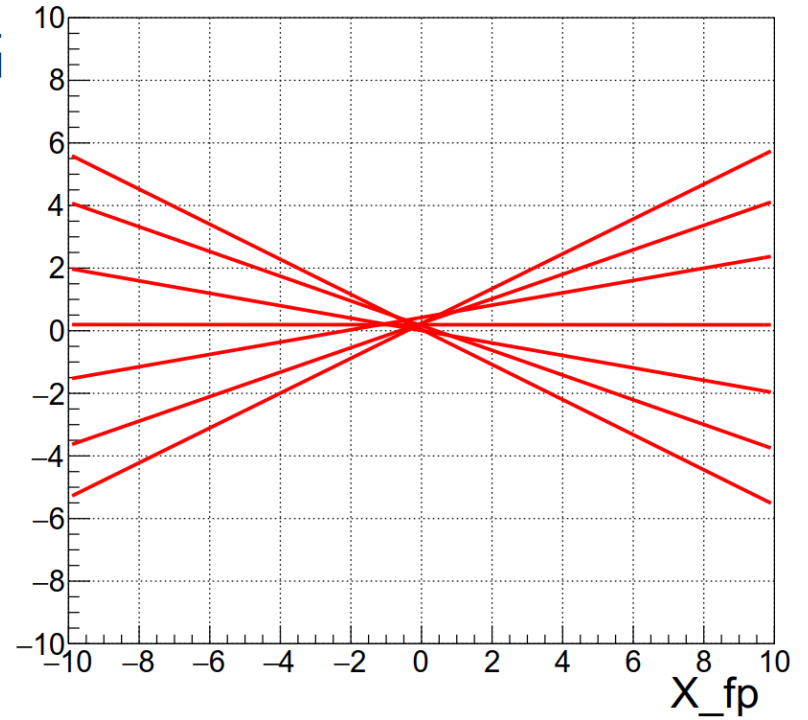


# Xfp vs Yfp fits

Run = 1337, Plot all fits



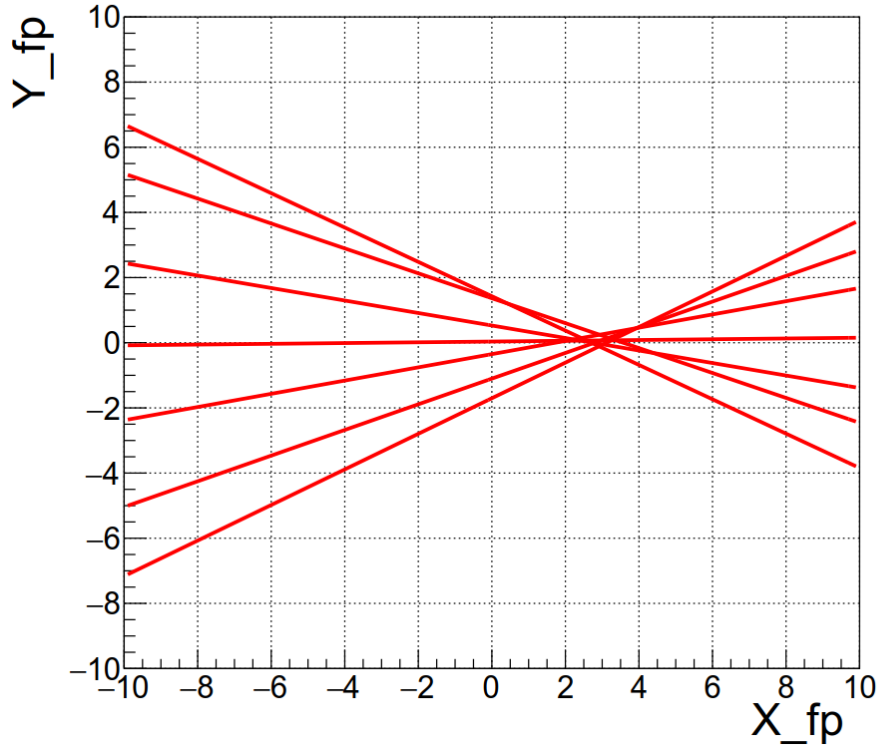
Run = 1136, Plot all fits



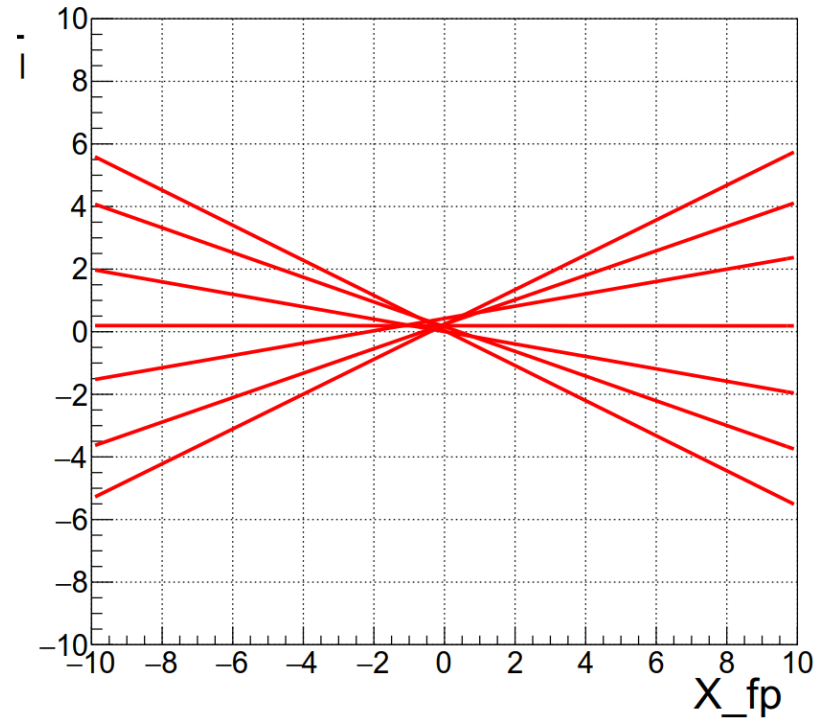


# Xfp vs Yfp fits

Run = 1528, Plot all fits



Run = 1136, Plot all fits



$$\text{delta} = 0.026x_{fp}(\text{mm})$$

Run	Xtar	Xfp expect	Xfp measured	Diff
1136	-4.5mm	+15mm	-4mm	19mm or delta = 0.5%
1337	-1mm	+3.4mm	+8mm	-4.6mm or delta = -0.1%
1528	-1mm	+3.4mm	+30m	-26.6mm or delta = -0.7%