

Alignment

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Update

Paras build into RichMirrCombinFit (the package that does the dTheta vs Phi fits):

- Increased number of calls for the fitter (x20)
 - If the MIGRAD fit fails try MINIMIZE
- => 54 MIGRAD fits fail, 46 of which succeed in MINIMIZE!!!**

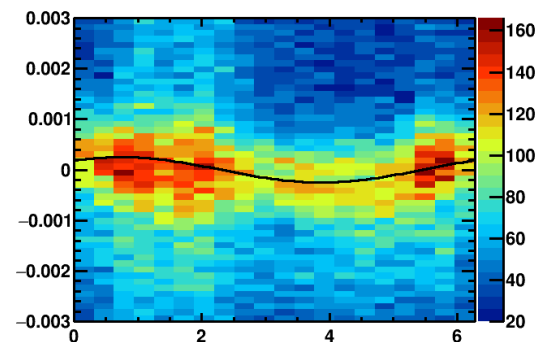


of events for alignment

Running **full alignment** on data-samples of different size **takes too long**.

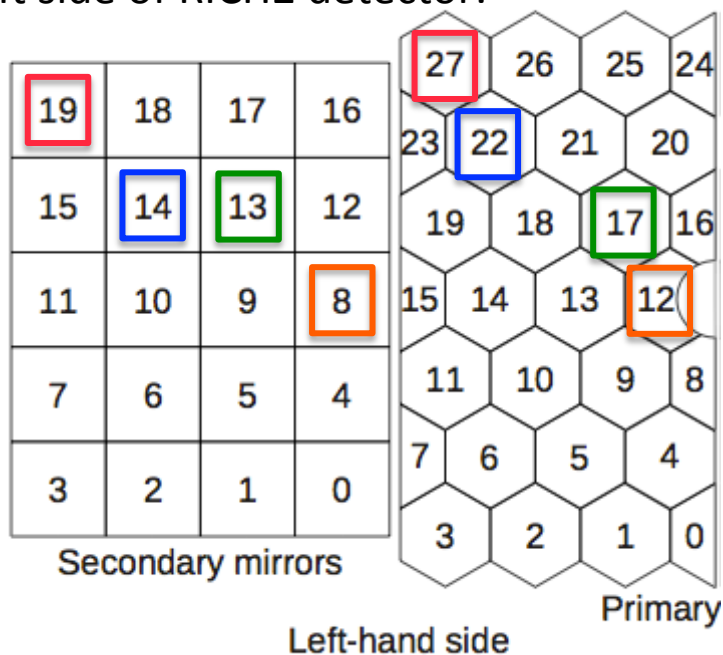
Toy-ish study:

- Histograms made using 2.7M events ←
- Generate new histograms “with fewer events” from
- Fit new histograms and compare results



Mirror combinations chosen for study

Left side of RICH2 detector:



Left side of RICH2 mirror combinations:

27,19	26,18	25,17	24,16
23,15	22,19	22,18	21,17
19,15	18,14	21,13	20,12
19,11	18,10	17,9	16,12
15,11	14,11	14,10	13,10
11,11	10,10	13,9	12,9
11,7	10,6	9,9	8,8
7,7	6,6	9,5	8,4
6,3	6,2	5,5	4,4
3,3	2,2	5,1	4,0
		1,1	0,0

of events for alignment

100 histograms 'with 300k events' generated + fitted (per mirror-pair)

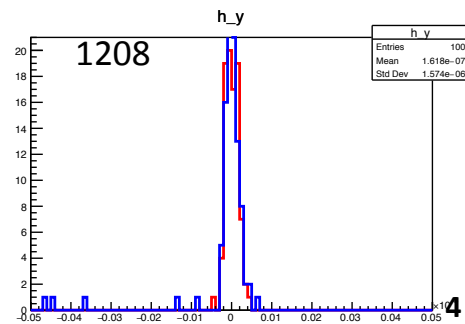
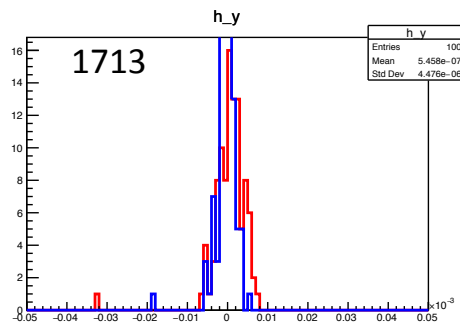
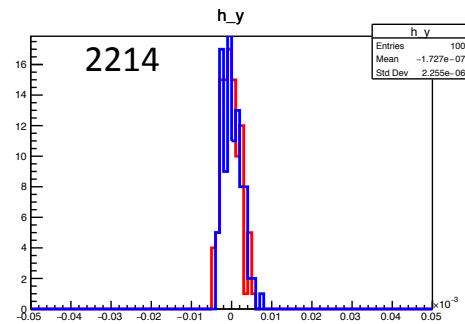
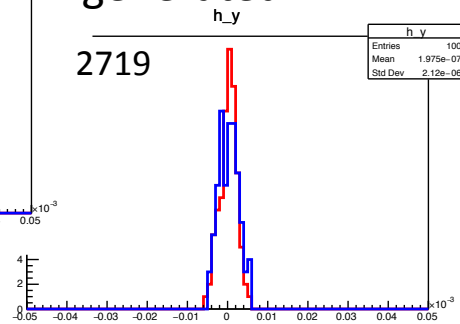
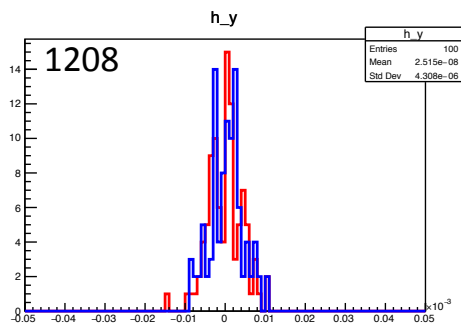
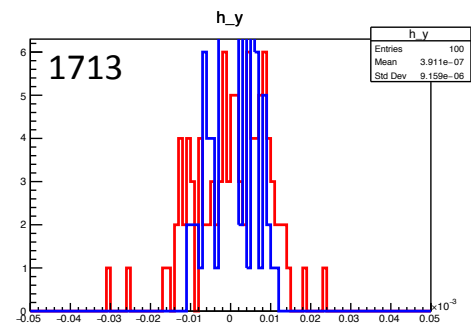
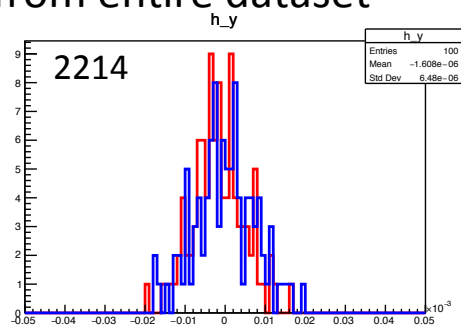
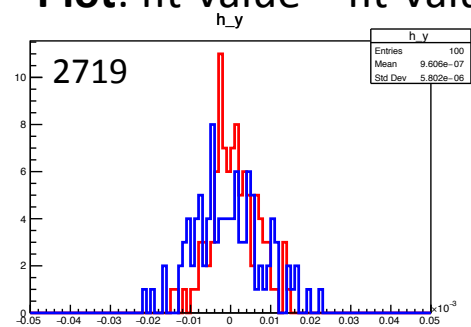
Plot: fit-value – fit-value from entire dataset

$$\delta\theta_{p,s}(\phi) \equiv \Theta_{p,s}^z \cos \phi + \Theta_{p,s}^y \sin \phi$$

— Θ^y distribution
— Θ^z distribution

Reference: 100 histograms with 2.7M events generated

1. Do for small and big tilts
2. Do for different 'number of events'



To do

1. Unified Gaussian width in the dTheta vs phi fits?
Same principle as above (compare results of fit with and without unified width)
2. Cherenkov angle resolution (ambiguous + unambiguous photons) in each iteration and give it to the Iterator.
3. Check for abnormal tilts/ magnification coefficients.
4. Antonis's idea: Calculate the magnification coefficients only for the first iteration...
5. Alarms and Monitoring

Anything else?

