Kaon Mass Data Second Look

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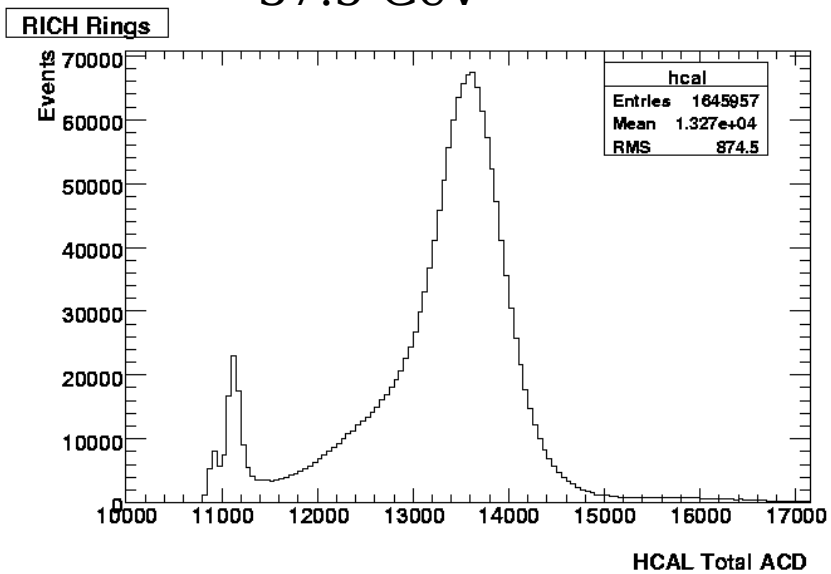
Amount of Data Taken

	Total	Protons		Kaons		Pions	
		Triggers	Fraction	Triggers	Fraction	Triggers	Fraction
37.5 GeV	1687073	475471	28.18%	587449	34.82%	599236	35.52%
40 GeV	2884920	934740	32.40%	904835	31.36%	1007062	34.91%
42.5 GeV	911701	339881	37.28%	282775	31.02%	276703	30.35%
All	5483694	1750092	31.91%	1775059	32.37%	1883001	34.34%

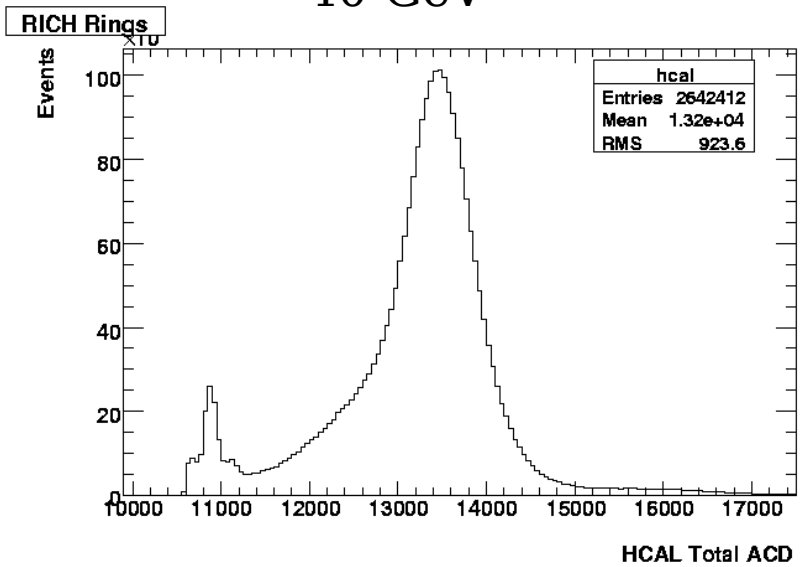
Numbers taken from kmass table in runs database

HCAL ADC Comparison

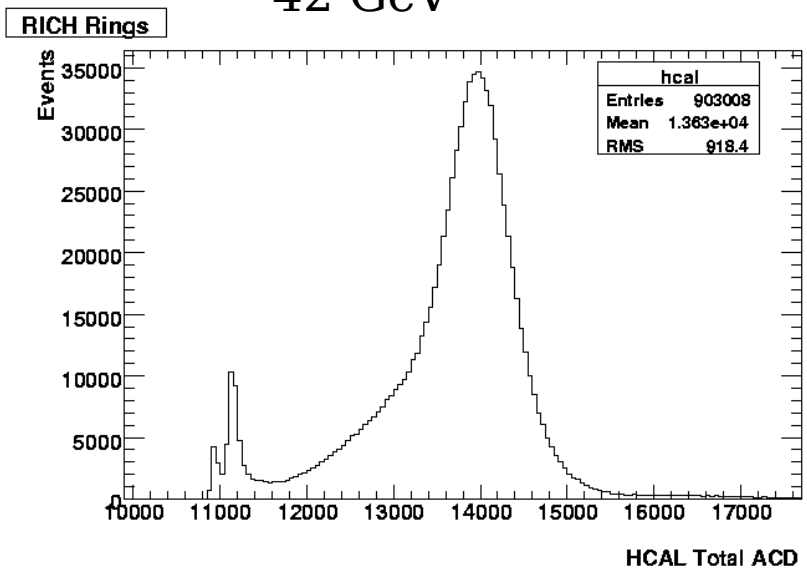
37.5 GeV



40 GeV



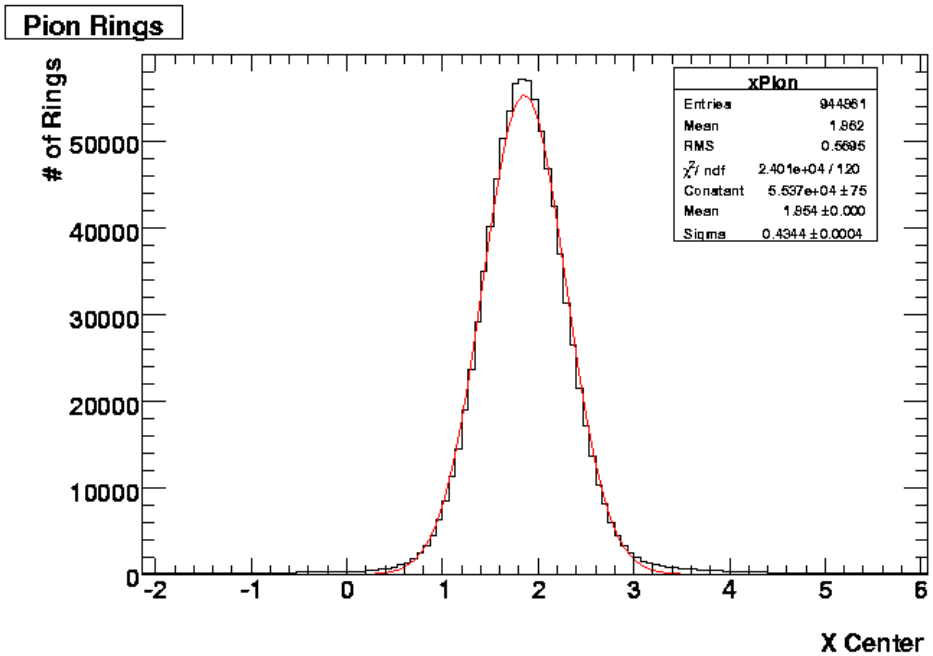
42 GeV



37 GeV Peak: 13,600
40 GeV Peak: 13,500
42 GeV Peak: 14,000

Make cuts within 1500 of peak value

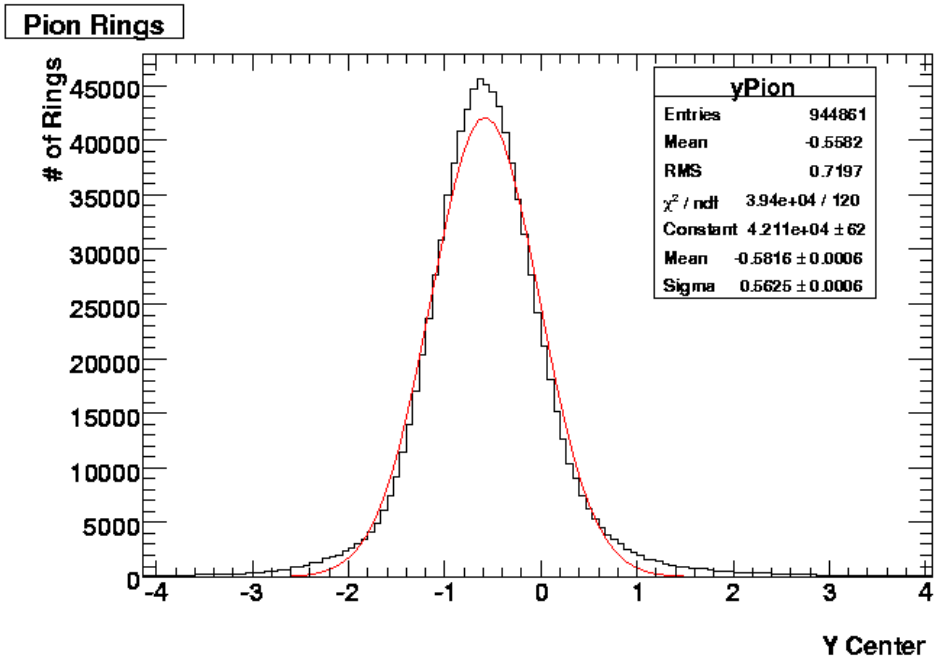
Ring Center Position – 40 GeV Pions



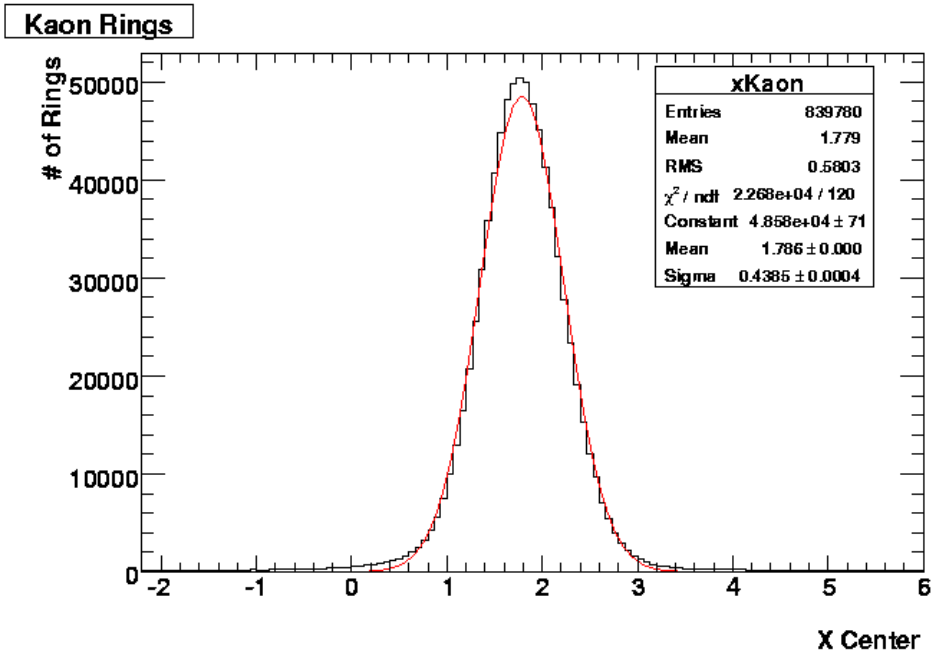
<x> = 1.95 cm
Sigma x = 0.43 cm

<y> = -0.58 cm
Sigma y = 0.56

Keep data within 2 std. dev. of mean



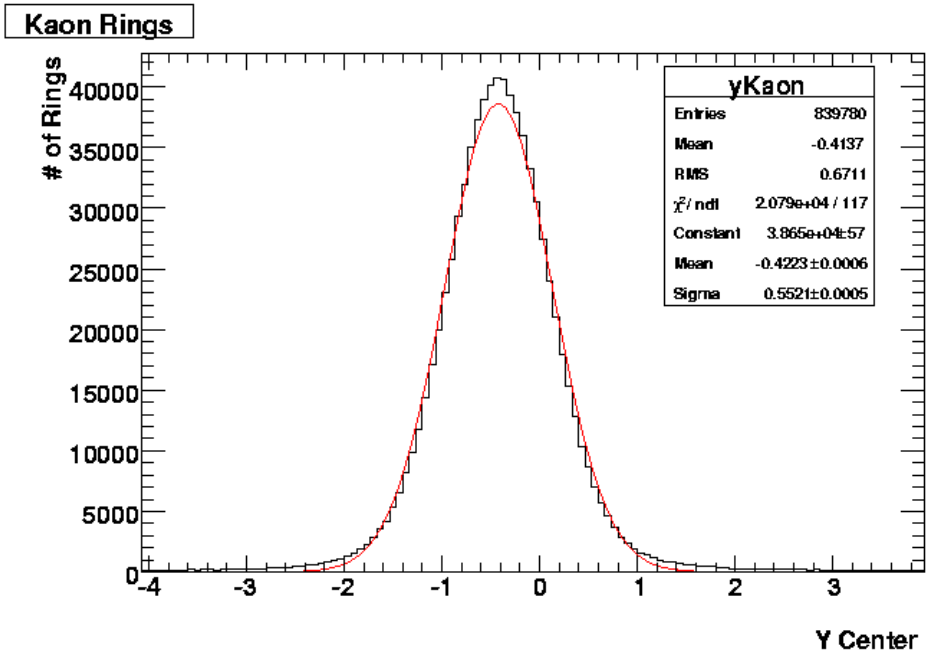
Ring Center Position – 40 GeV Kaons



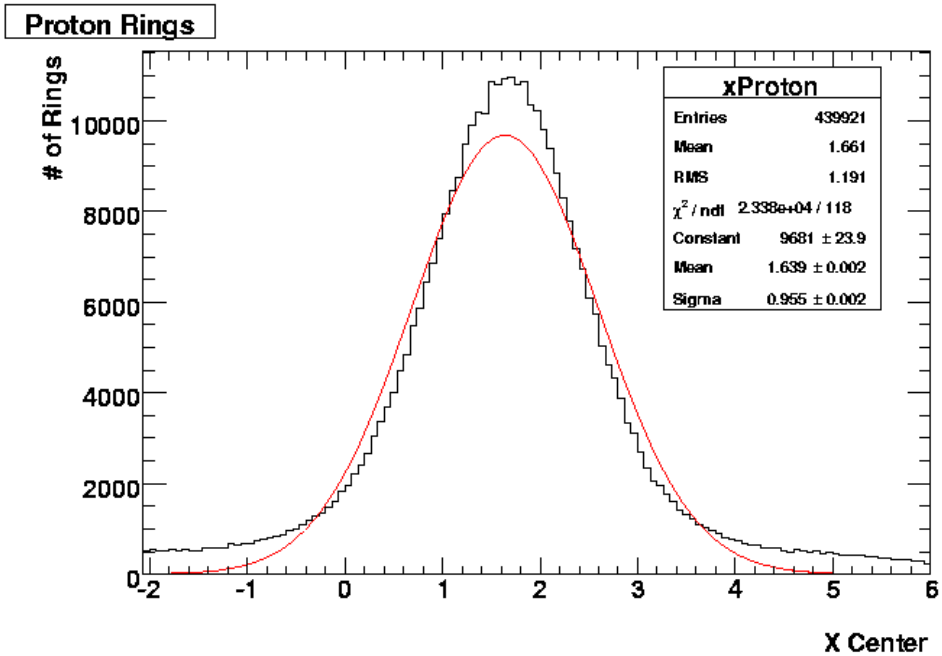
<x> = 1.79 cm
Sigma x = 0.44 cm

<y> = -0.42 cm
Sigma y = 0.55

Keep data within 2 std. dev. of mean



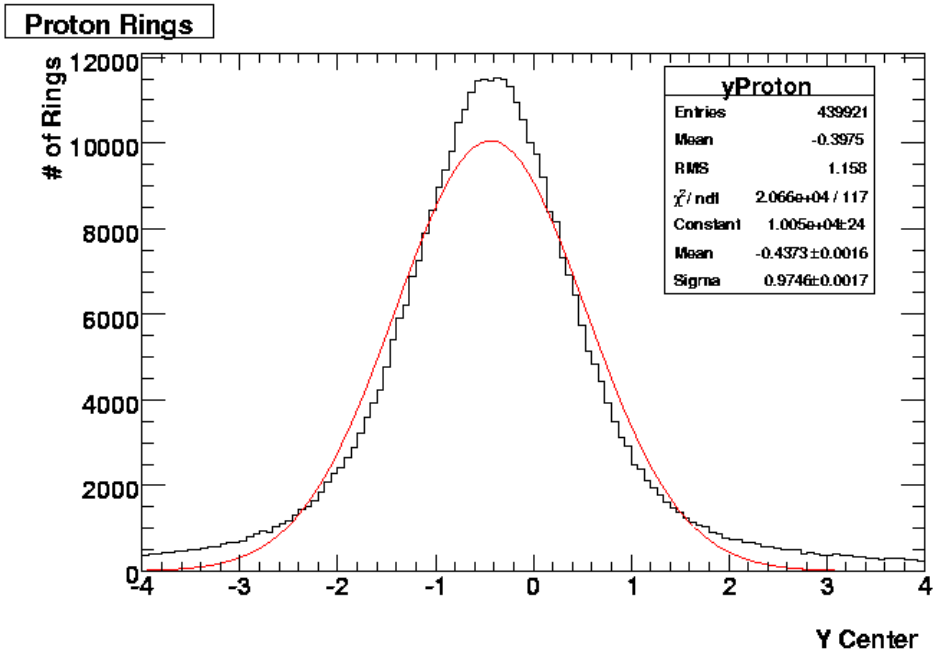
Ring Center Position – 40 GeV Protons



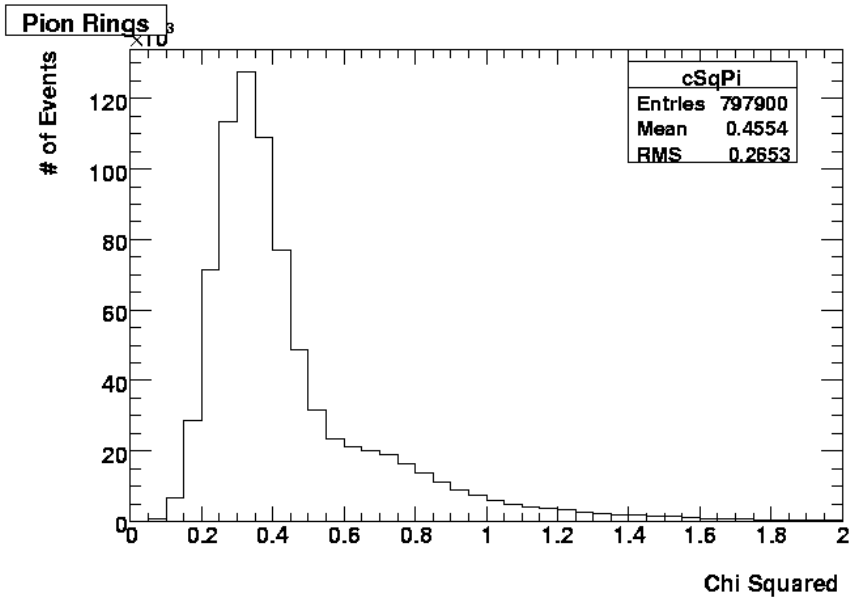
<x> = 1.60 cm
Sigma x = 0.96 cm

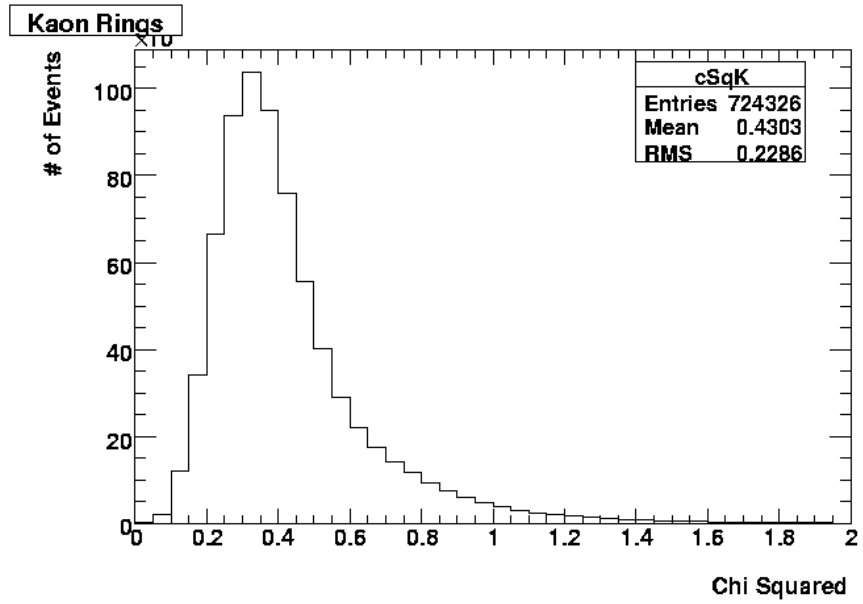
<y> = -0.44 cm
Sigma y = 0.97

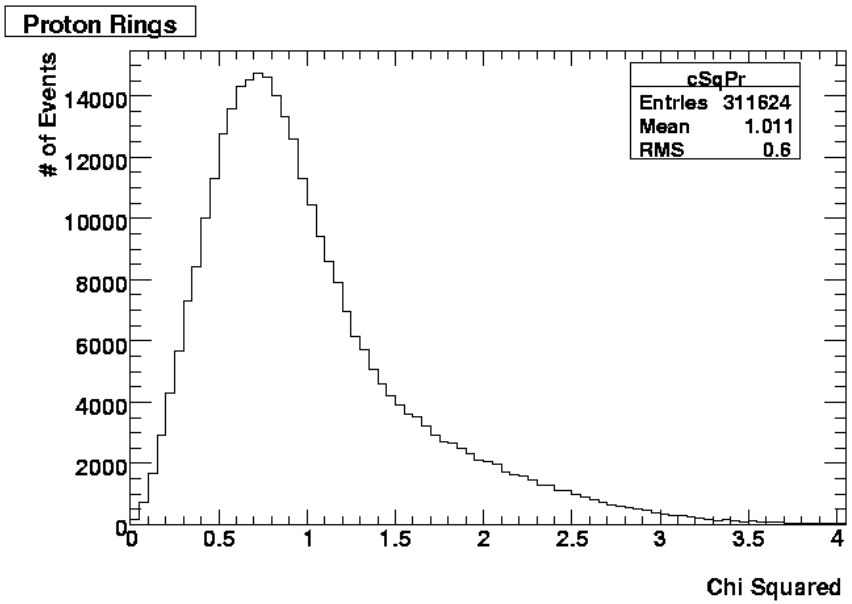
Keep data within 2 std. dev. of mean



Goodnes of Fit







Chi^2/ndf from circle fits

Cut out low end of tails. Require:
< 1 for pions and kaons
<3 for protons

Same cuts made for 37, 42 GeV sets

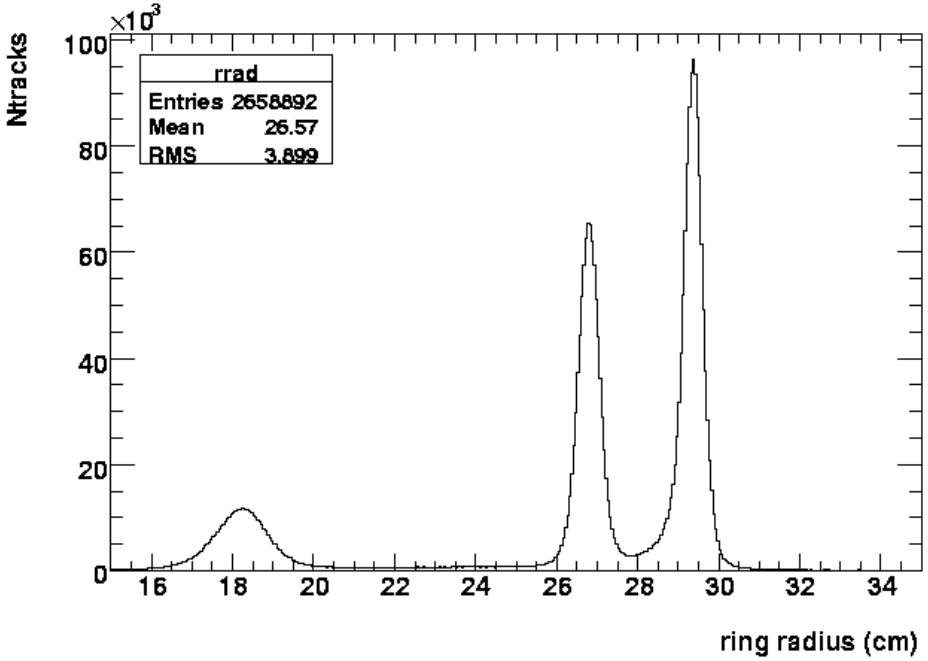
Summary of Cuts for 40 GeV

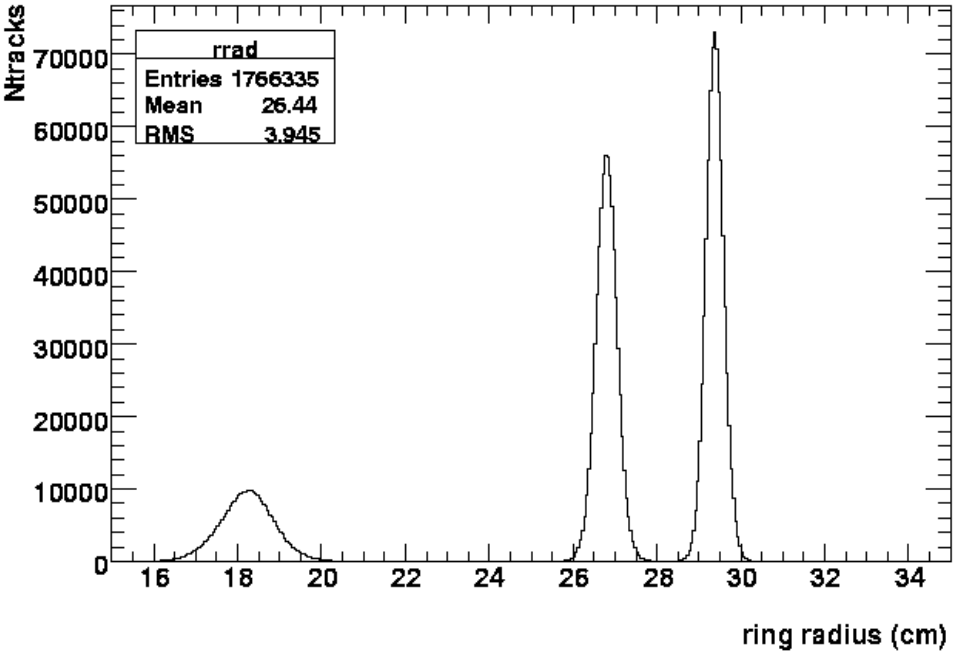
Cut	Total	Protons	Kaons	Pions
None	2658892			
Beam Tag	2642412	513793	984112	1144507
One Ring	2527766	494396	961039	1072331
Hcal	2224562	439921	839780	944861
Ring Center X	1957694	333943	763844	859907
Ring Center Y	1833850	311624	724326	797900
GOF	1766355	308610	701202	756523

Final Fractions After Cuts:

Protons: 17.5%
Kaons: 39.7%
Pions: 42.8%

Ring Radius Plots for 40 GeV





Top: Befor cuts
Right: After cuts

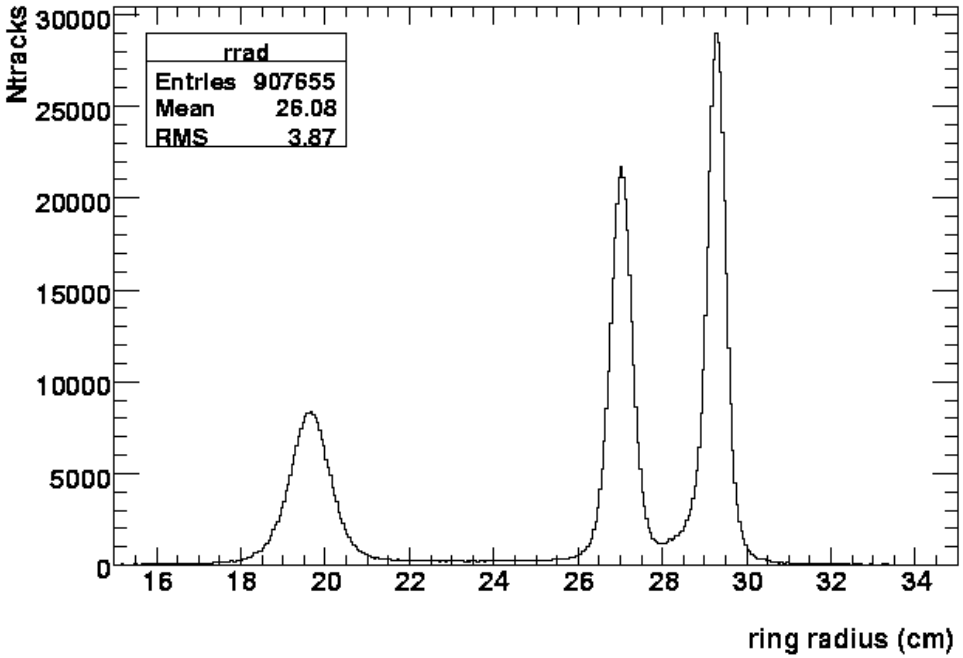
Summary of Cuts for 42 GeV

Cut	Total	Protons	Kaons	Pions
None	907655			
Beam Tag	903008	252584	322644	327780
One Ring	867161	244534	314297	308330
Hcal	779543	224895	278675	276063
Ring Center X	697468	192000	253543	251925
Ring Center Y	648319	173414	239598	235306
GOF	629113	172319	231275	225519

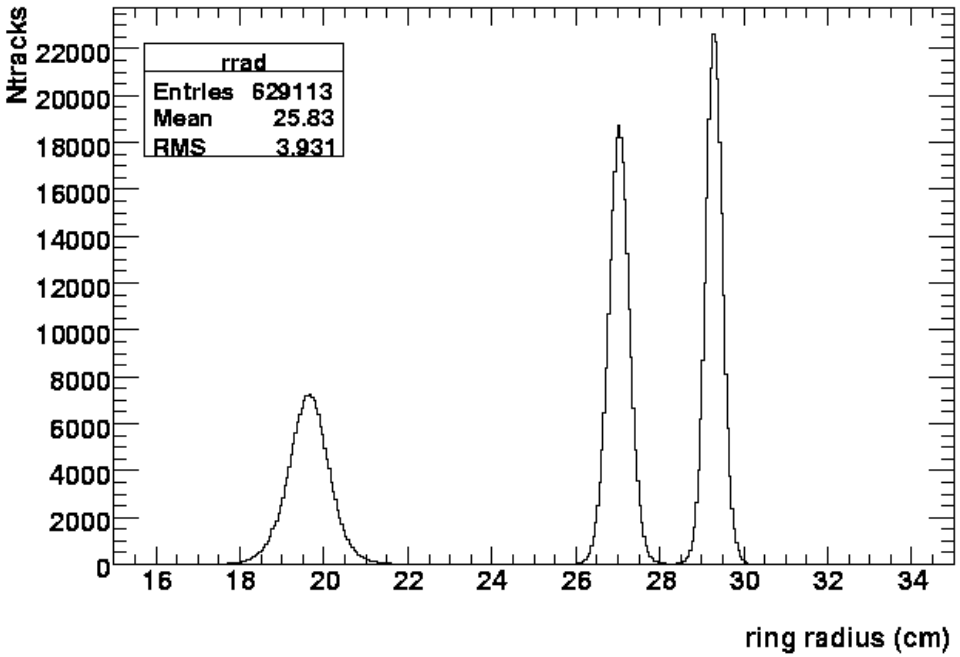
Final Fractions After Cuts:

Protons: 27.4%
Kaons: 36.8%
Pions: 35.8%

Ring Radius Plots for 42 GeV



Top: Befor cuts
Right: After cuts



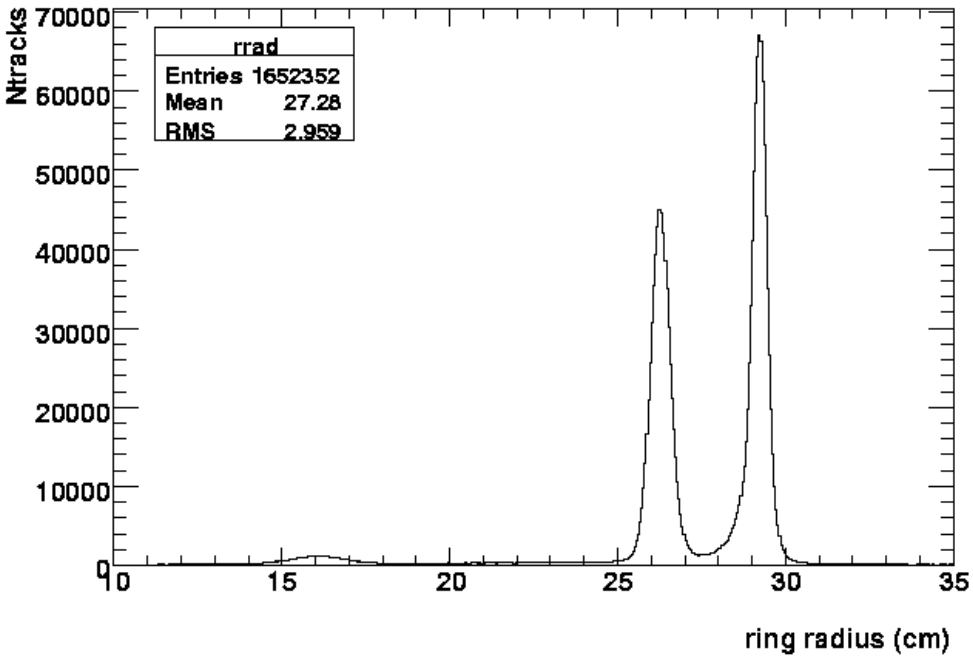
Summary of Cuts for 37 GeV

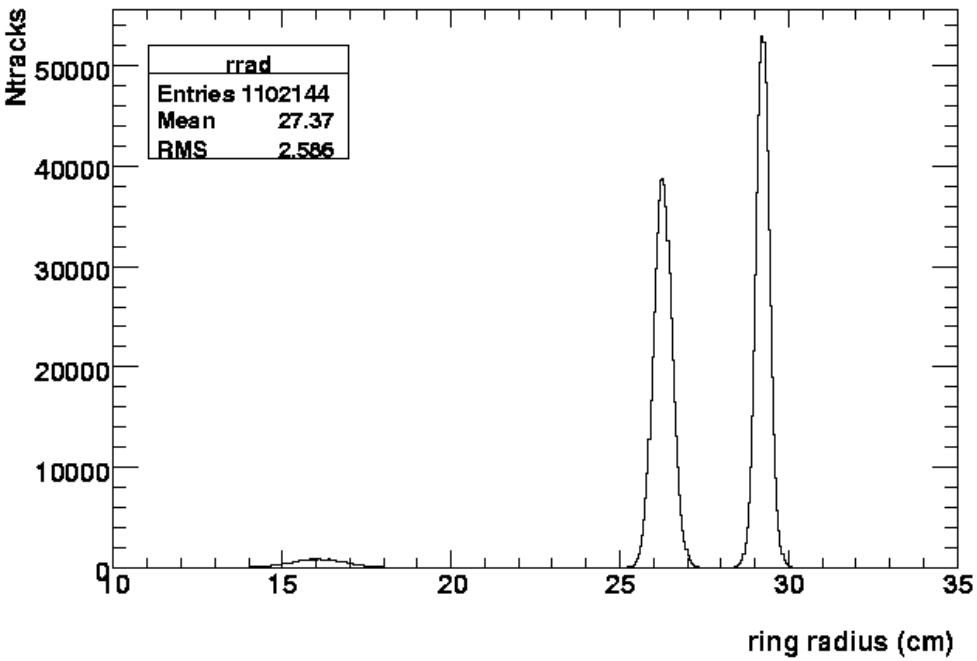
Cut	Total	Protons	Kaons	Pions
None	1652352			
Beam Tag	1645957	129161	734170	782626
One Ring	1577957	122886	720458	733905
Hcal	1403649	104388	640057	659204
Ring Center X	1236146	48160	586808	601178
Ring Center Y	1157498	41064	554085	562349
GOF	1102144	39740	531147	531257

Final Fractions After Cuts:

Protons: 3.6%
Kaons: 48.2%
Pions: 48.2%

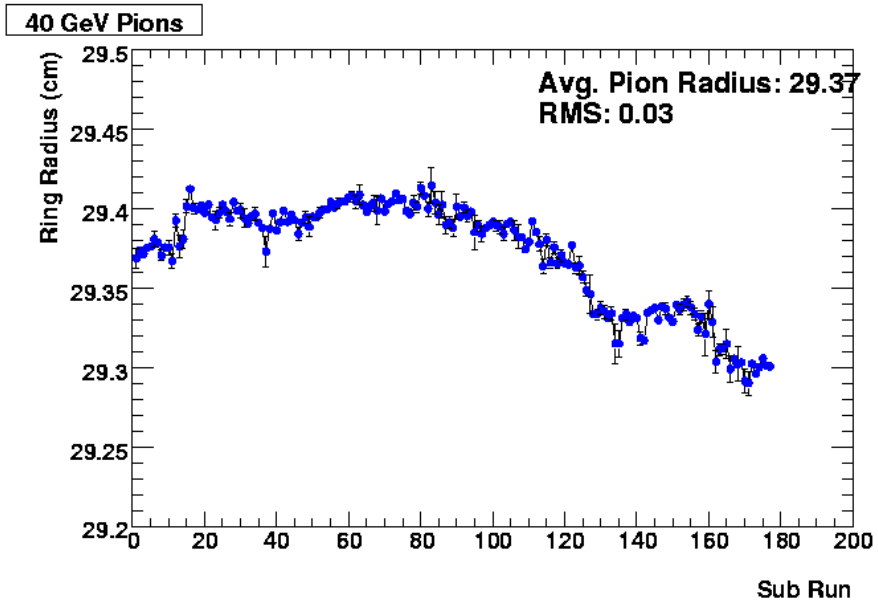
Ring Radius Plots for 37 GeV

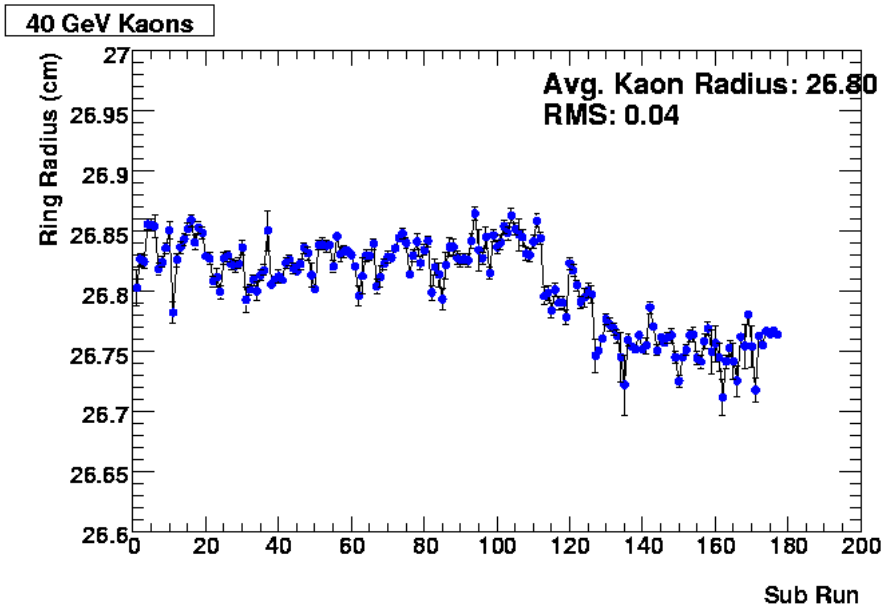


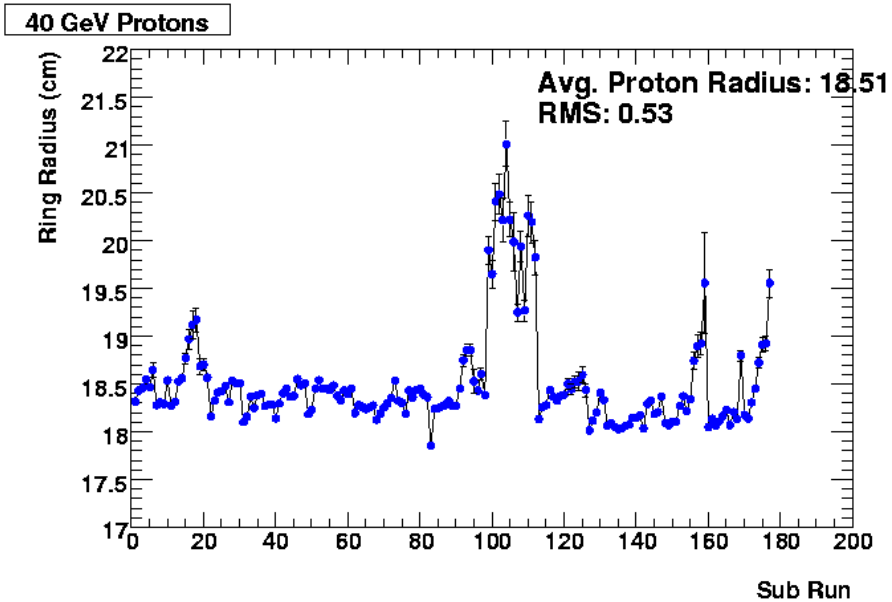


Top: Befor cuts
Right: After cuts

Ring Radius Stability 40 GeV

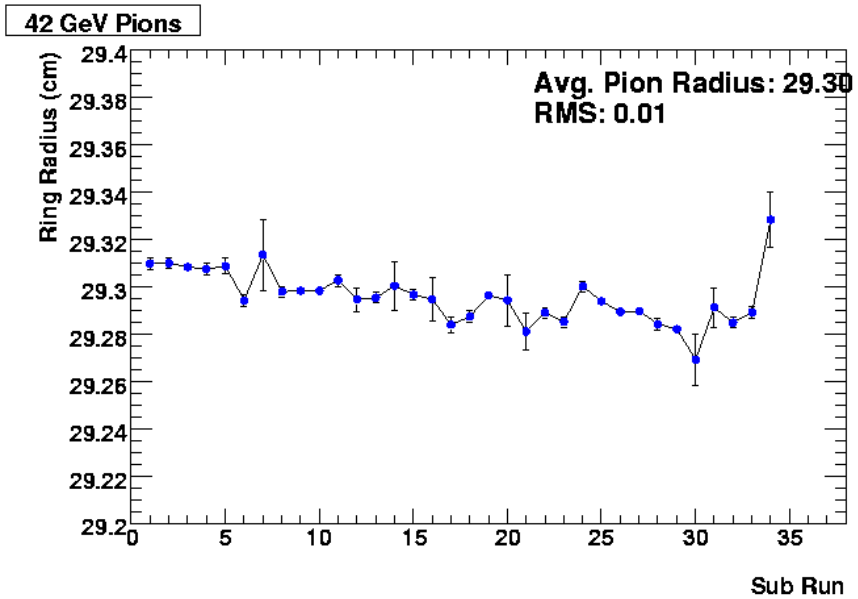


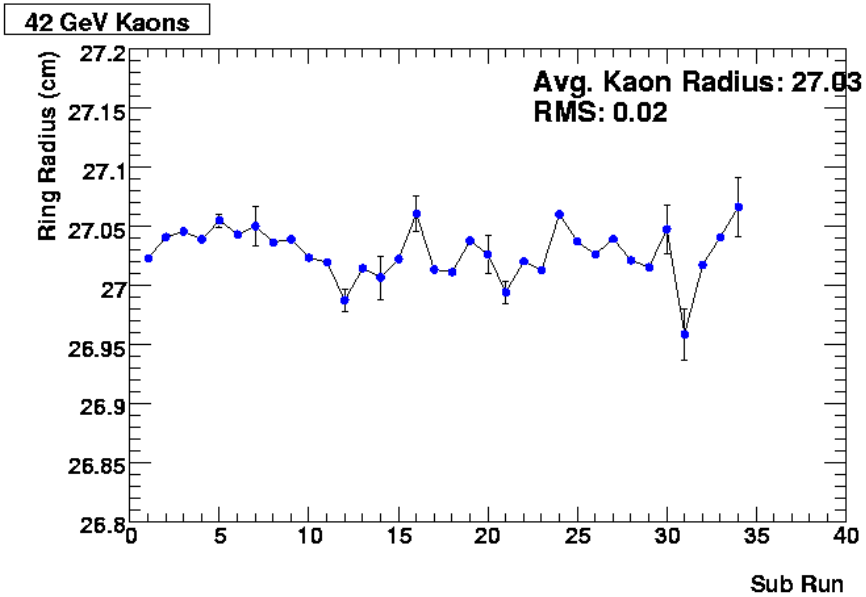


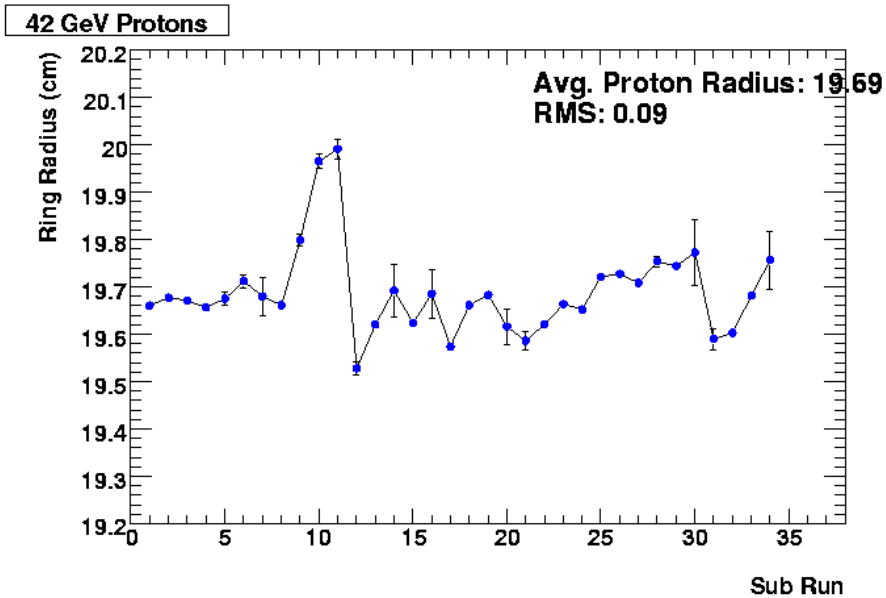


Pion, Kaon radii show downward trend toward end of run. This makes sense if gas is leaking.

Ring Radius Stability 42 GeV

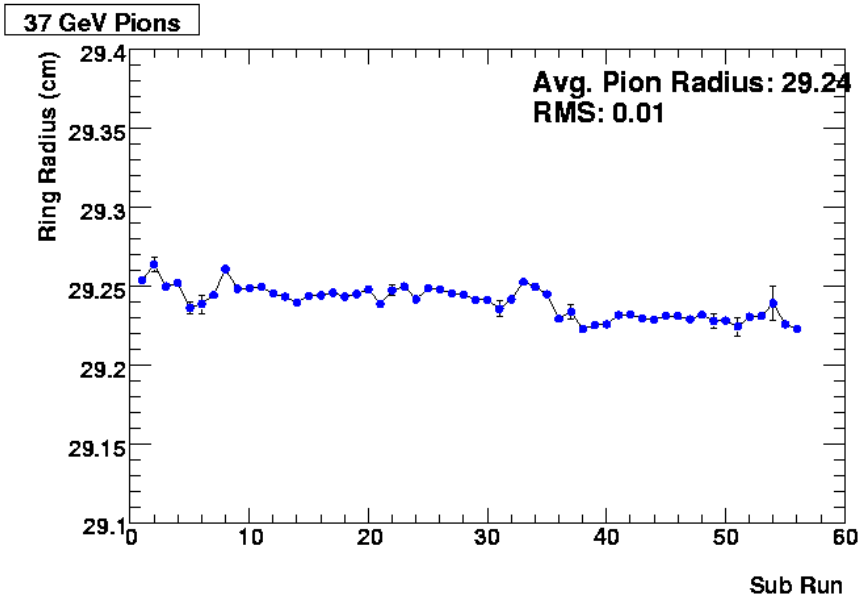


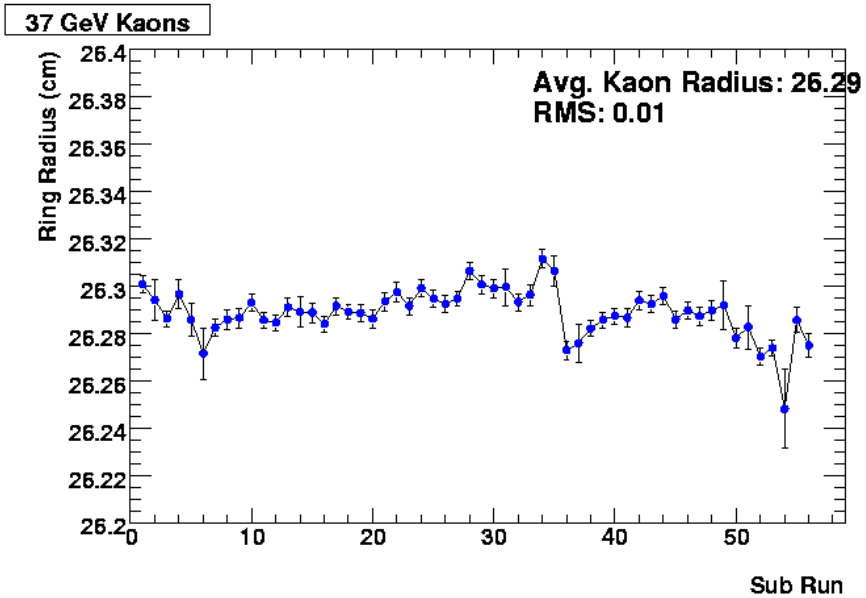


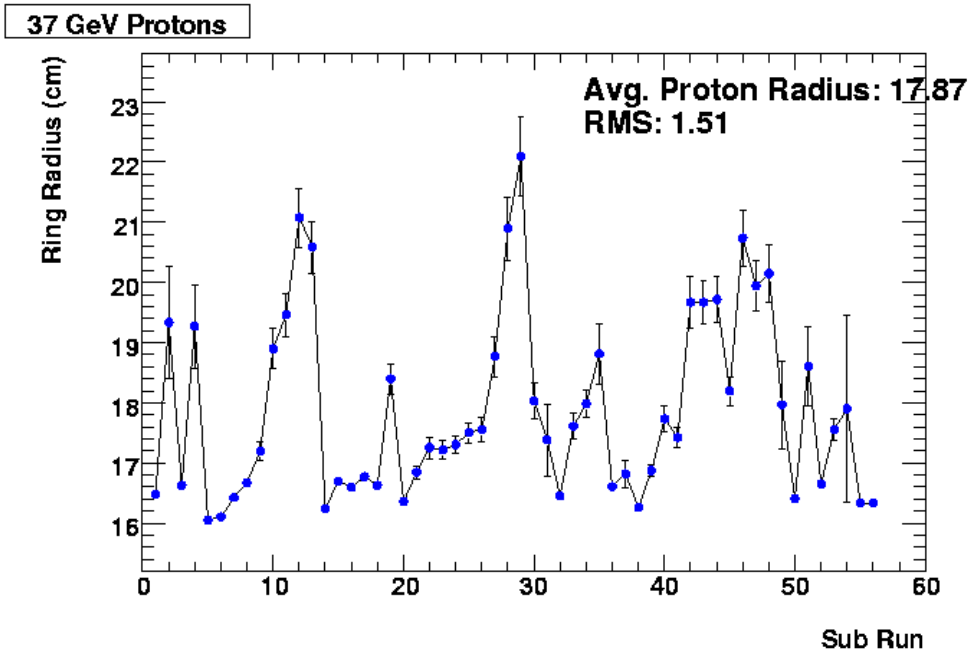


Pion radius slowly decreases over course of run

Ring Radius Stability 37 GeV







Proton radius distribution very spikey. Statistics are rather low.

Things To Do

Why don't fractions match database?

Convert Hcal ADC to energy

Use chambers to aid in cuts

Make use of RICH pressure/temperature readings from slow control