Excess Proton v_1

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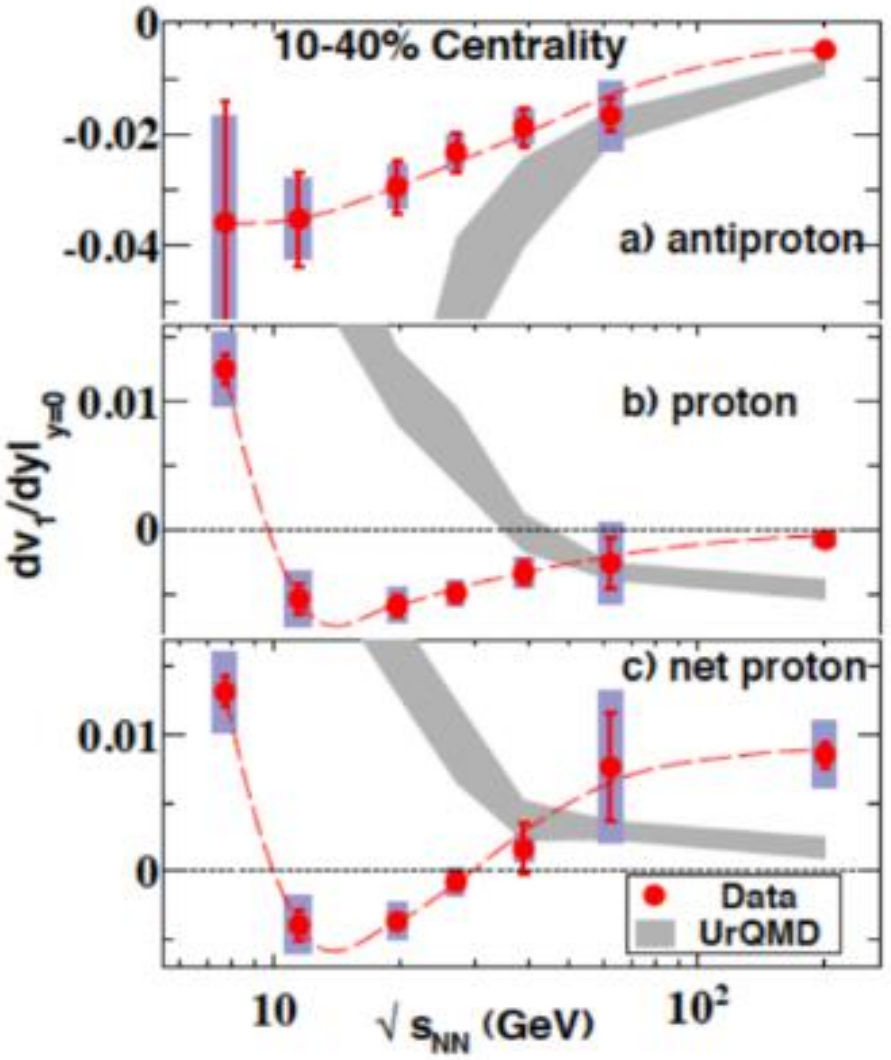
Motivation

- Net proton v_1 considers v_1 of transported and produced protons to be independent:
- $v_{1,net} = \frac{(v_{1,p} - r v_{1\bar{p}})}{1-r}$

(r is the yield ratio of anti-protons to protons)

- dv_1/dy of net protons at mid-rapidity exhibits non-monotonic behavior as a function of collision energy.

- Alternatively, we can look at excess proton v_1, which treats transported proton v_1 as also being driven by the same "medium component" as produced proton
- $v_{1,excess} = \frac{(v_{1,p} - v_{1\bar{p}})}{1-r}$



Datasets:

BES II 7.7 GeV, 9.2 GeV, 11.5 GeV, 14.6 GeV, 17.3 GeV
Year: 2021, 2020,2020, 2019,2021
Production tag:

- production_7p7GeV_2021
- production_9p2GeV_2020 (also b and c)
- production_11p5GeV_2020
- production_14p5GeV_2019
- production_17p3GeV_2021

Triggers used: minbias only

Event Level cuts

For All Energies

- Abs(Vz)<145 cm
- Vr<2 cm
- Pileup rejection from Centrality group

Track level cuts

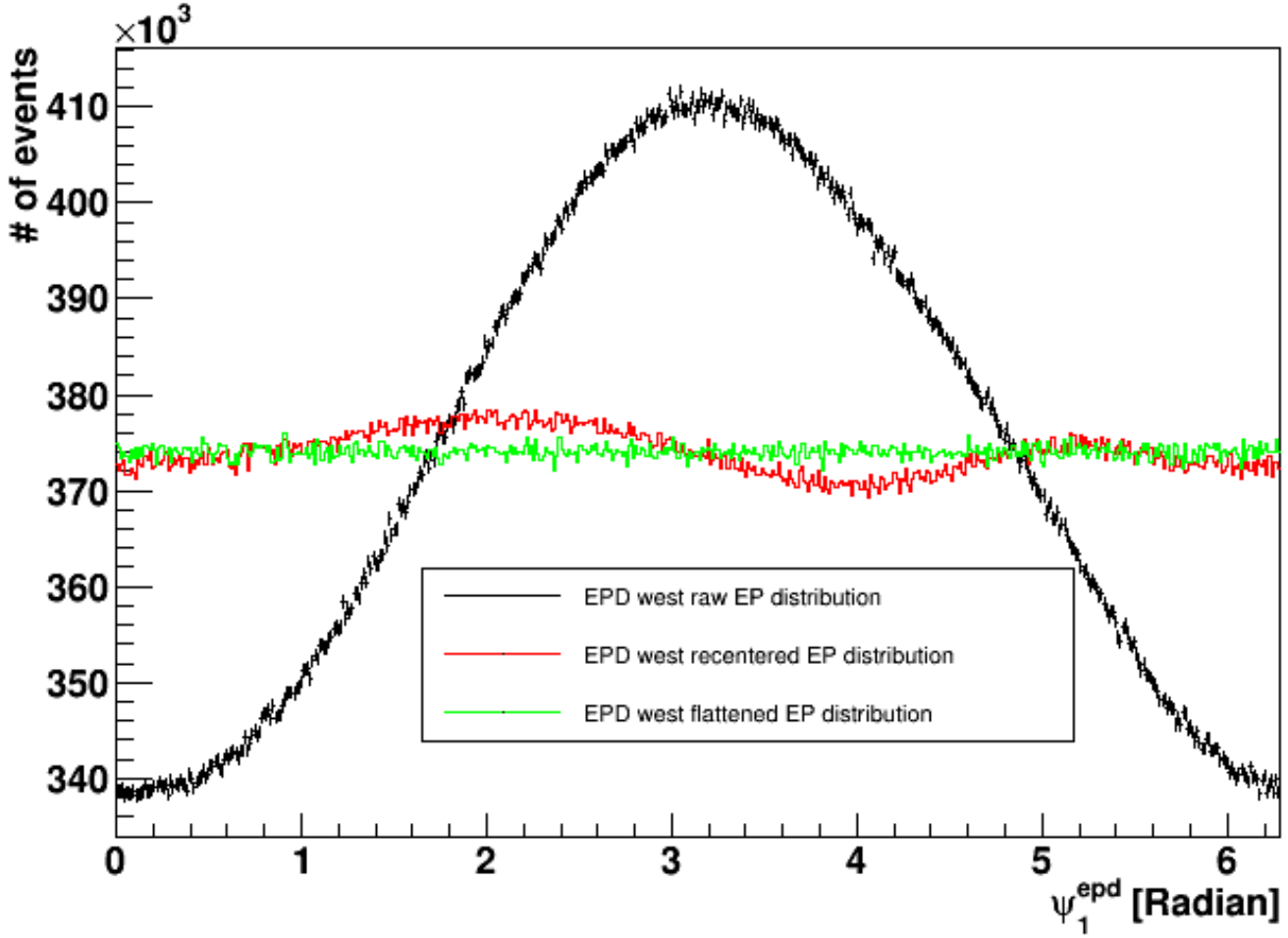
- DCA<3.0 cm
  - (DCA<1.0 cm for 9.2 GeV)
- NhitsFit>15
- NhitsFit/NhitsPoss>0.52
- nHitsdEdx>10
- 0.4<Pt<2.0 GeV
- |P|<3.0 GeV
- Abs(η)<2.0

PID:

if(TOF_track)
{
    if(tof_y_local>1.8) return false;
    if(0.8<mass^2<1.0 GeV^2 && |nσ| <2.5**)return true;
    return false;
}
else if(P<0.8* && |nσ| <2.5**)return true;
return false;
(* not used for 7.7 and 14.6 GeV)
(**|nσ| <3.0 for 7.7 and 14.6 GeV)

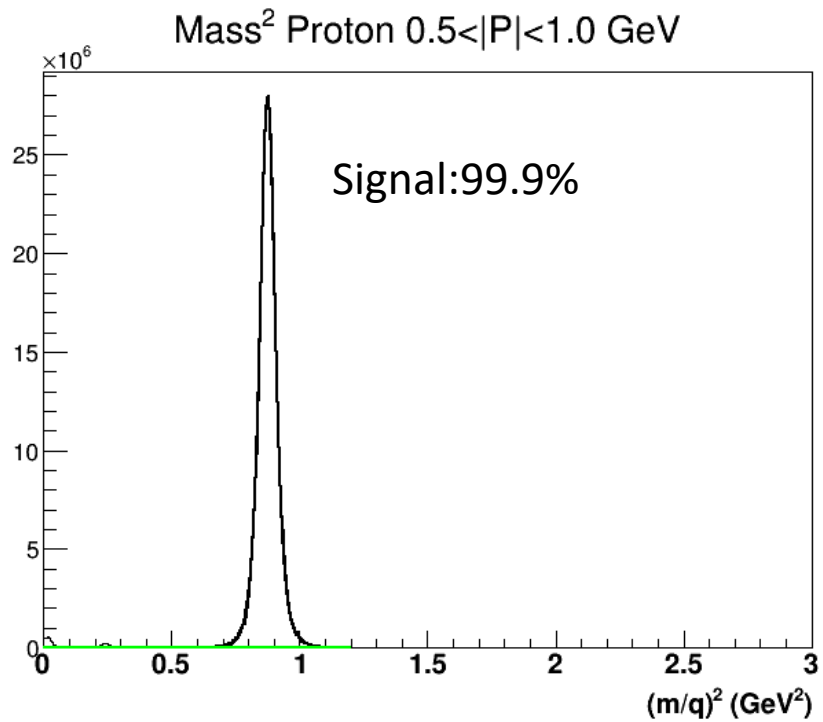
Analysis Procedure

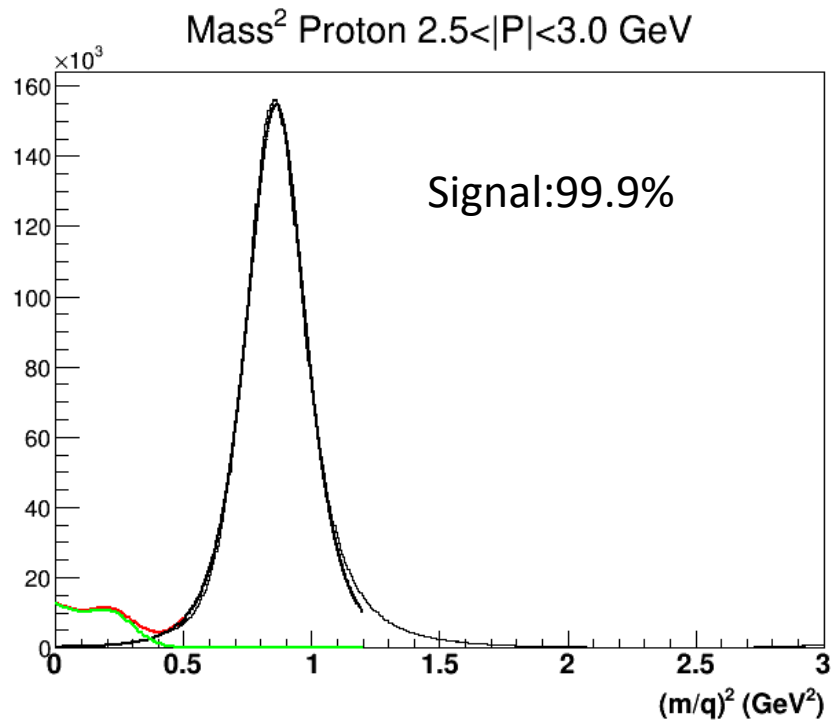
- Event Plane was calculated with Event Plane Detector
- The Event Plane was Recentered and flattened
- Eta Weighting was used for 9.2 and above.

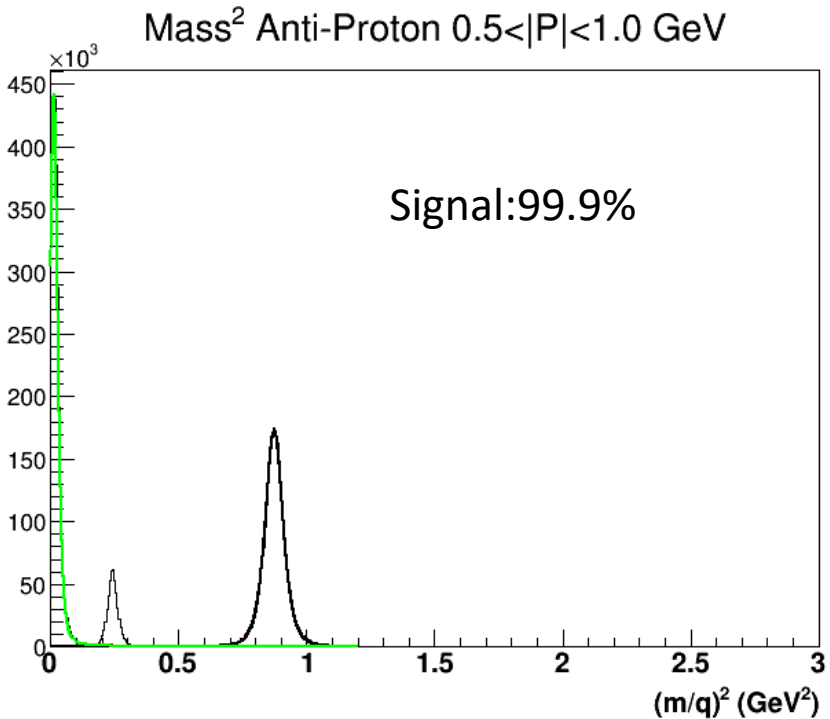


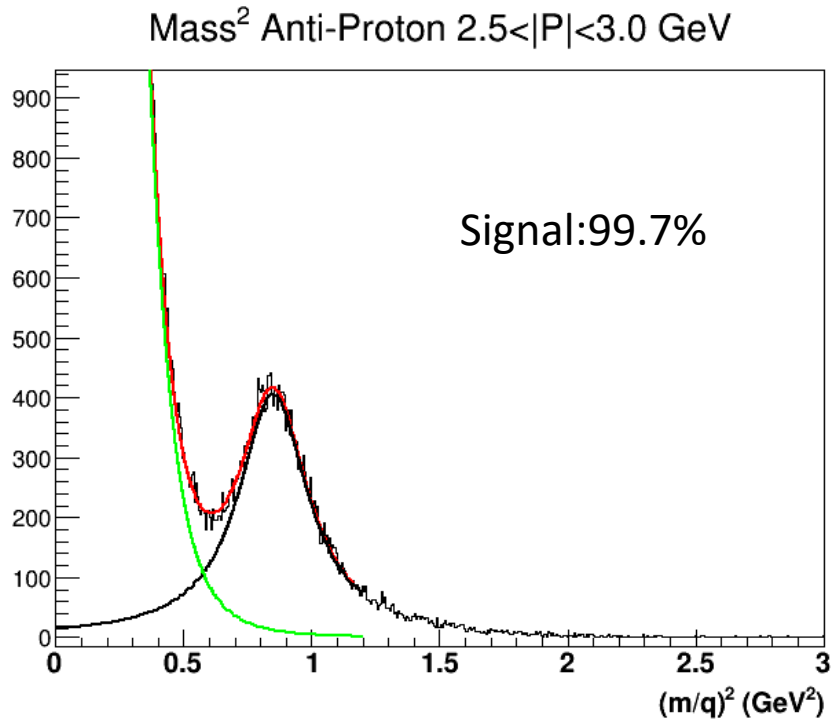
PID Purity

- Purity from these cuts stays high even at high momentum
- 7.7 GeV









Systematics

systematic check	7.7	9.2	11.5	14.6	17.3	19.6
dca<1	done	**dca<3**	done	done	done	done
dca<2	done	done	done	done	done	done
nhitsfit>18	done	done	done	done	done	done
nhitsfit>20	done	done	done	done	done	done
nsigma cut <2	done	done	done	done	done	done
nsigma cut <3	**omit**	done	done	**omit**	done	done
loose mass	done	done	**todo**	done	**todo**	done

- Further details in backup

Systematics 9.2 GeV

$$Barlow\ Test = \frac{|Y_i - Y_{df}|}{\sqrt{|\sigma_i^2 - \sigma_{df}^2|}}$$

$$Barlow\ Error = \sqrt{(Y_i - Y_{df})^2 - |\sigma_i^2 - \sigma_{df}^2|}$$

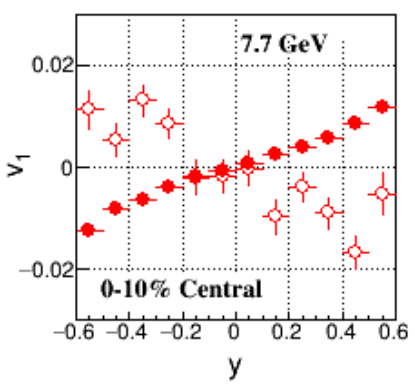
9.2 GeV				
proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	1.69E-03	1.12E-04		
dca<3	1.32E-03	1.07E-04	11.30	3.70E-04
dca<2	1.41E-03	1.08E-04	9.47	
Nhitsfit>18	1.71E-03	1.12E-04	2.20	1.14E-05
Nhitsfit>20	1.71E-03	1.12E-04	1.62	
nsigma<2.0	2.00E-03	1.16E-04	9.87	3.03E-04
nsigma<3.0	1.54E-03	1.10E-04	7.41	
loose mass	2.56E-03	1.09E-04	33.73	8.64E-04
Total:				9.88E-04

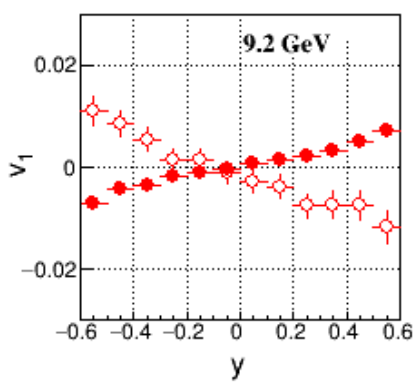
9.2 GeV				
anti-proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-4.33E-02	9.46E-04		
dca<3	-4.27E-02	8.59E-04	1.62	5.06E-04
dca<2	-4.29E-02	8.77E-04	1.37	
nhitsfit>18	-4.34E-02	9.49E-04	0.47	0.00E+00
nhitsfit>20	-4.35E-02	9.51E-04	1.89	1.60E-04
nsigma<2.0	-4.38E-02	9.88E-04	1.48	
nsigma<3.0	-4.27E-02	9.19E-04	2.77	5.83E-04
loose mass	-4.28E-02	9.16E-04	2.10	4.34E-04
Total:				9.00E-04

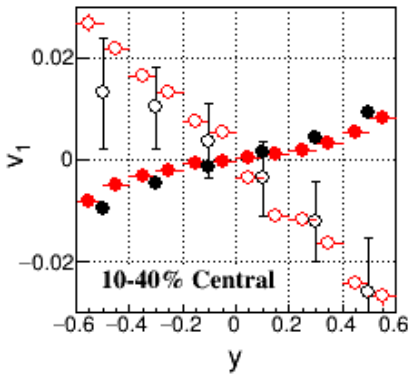
9.2 GeV				
excess proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	4.56E-02	1.93E-03		
dca<3	4.47E-02	1.76E-03	1.17	4.92E-04
dca<2	4.49E-02	1.79E-03	1.00	
nhitsfit>18	4.56E-02	1.94E-03	0.28	0.00E+00
nhitsfit>20	4.58E-02	1.94E-03	0.97	0.00E+00
nsigma<2.0	4.63E-02	2.02E-03	1.23	
nsigma<3.0	4.48E-02	1.88E-03	1.65	6.02E-04
loose mass	4.60E-02	1.87E-03	0.79	0.00E+00
Total:				7.77E-04

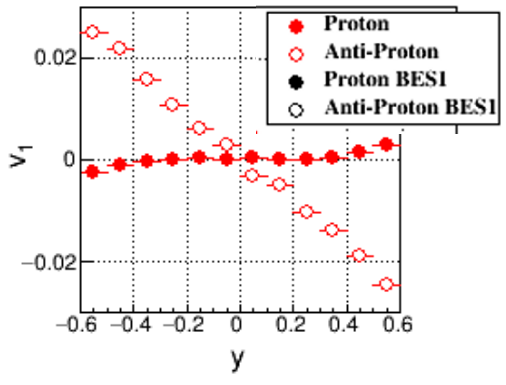
9.2 GeV				
net proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	2.32E-03	2.28E-04		
dca<3	2.00E-03	2.19E-04	4.84	
dca<2	2.08E-03	2.20E-04	4.07	2.35E-04
nhitsfit>18	2.33E-03	2.29E-04	0.99	0.00E+00
nhitsfit>20	2.33E-03	2.29E-04	0.77	0.00E+00
nsigma<2.0	2.63E-03	2.37E-04	4.88	2.99E-04
nsigma<3.0	2.17E-03	2.25E-04	3.58	
loose mass	3.20E-03	2.22E-04	16.82	8.75E-04
Total:				9.54E-04

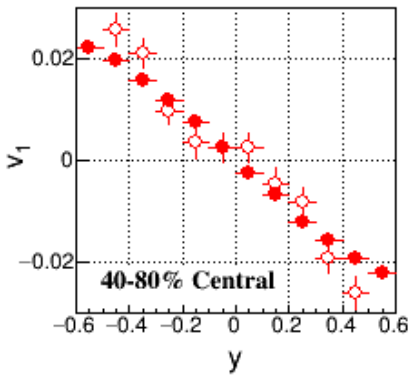
Proton and Anti-Proton Directed Flow

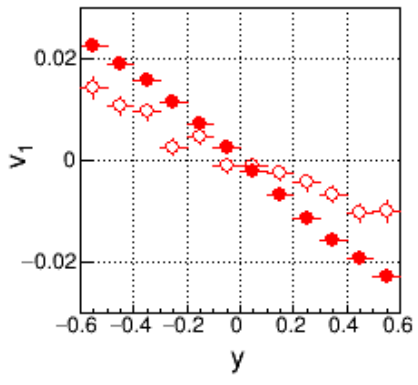




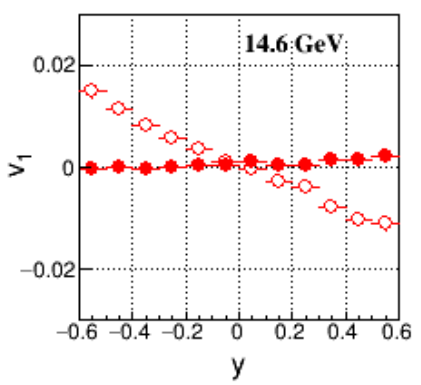


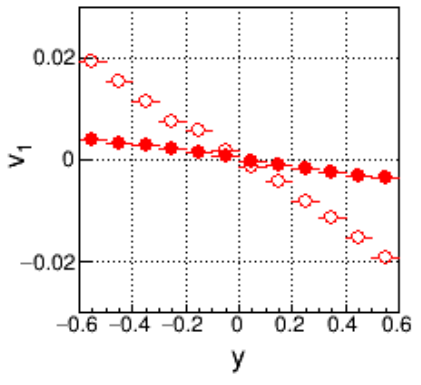


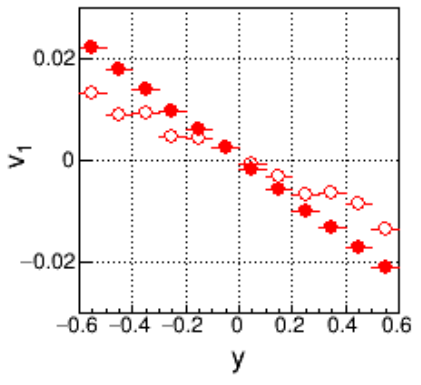




Not Quite Ready

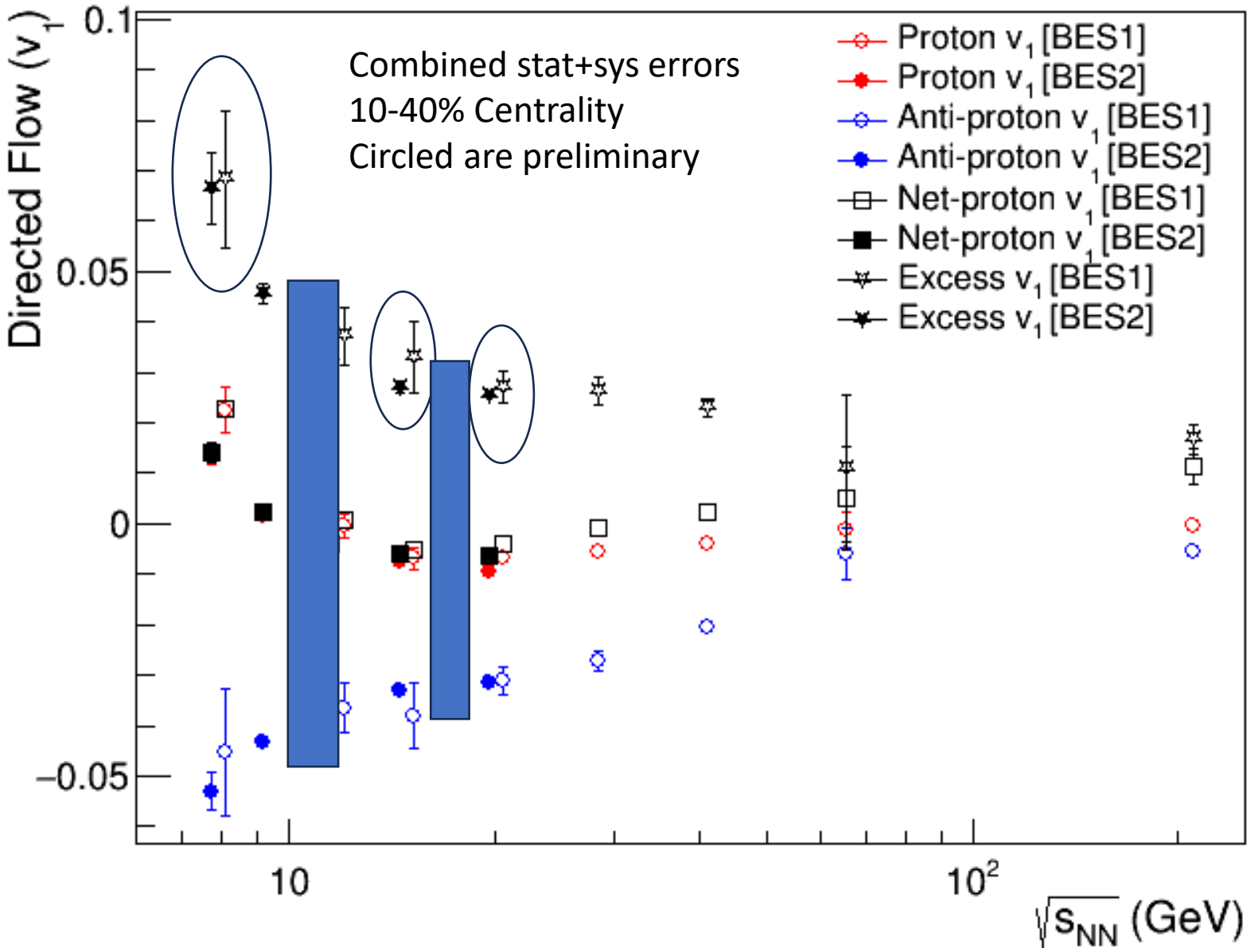


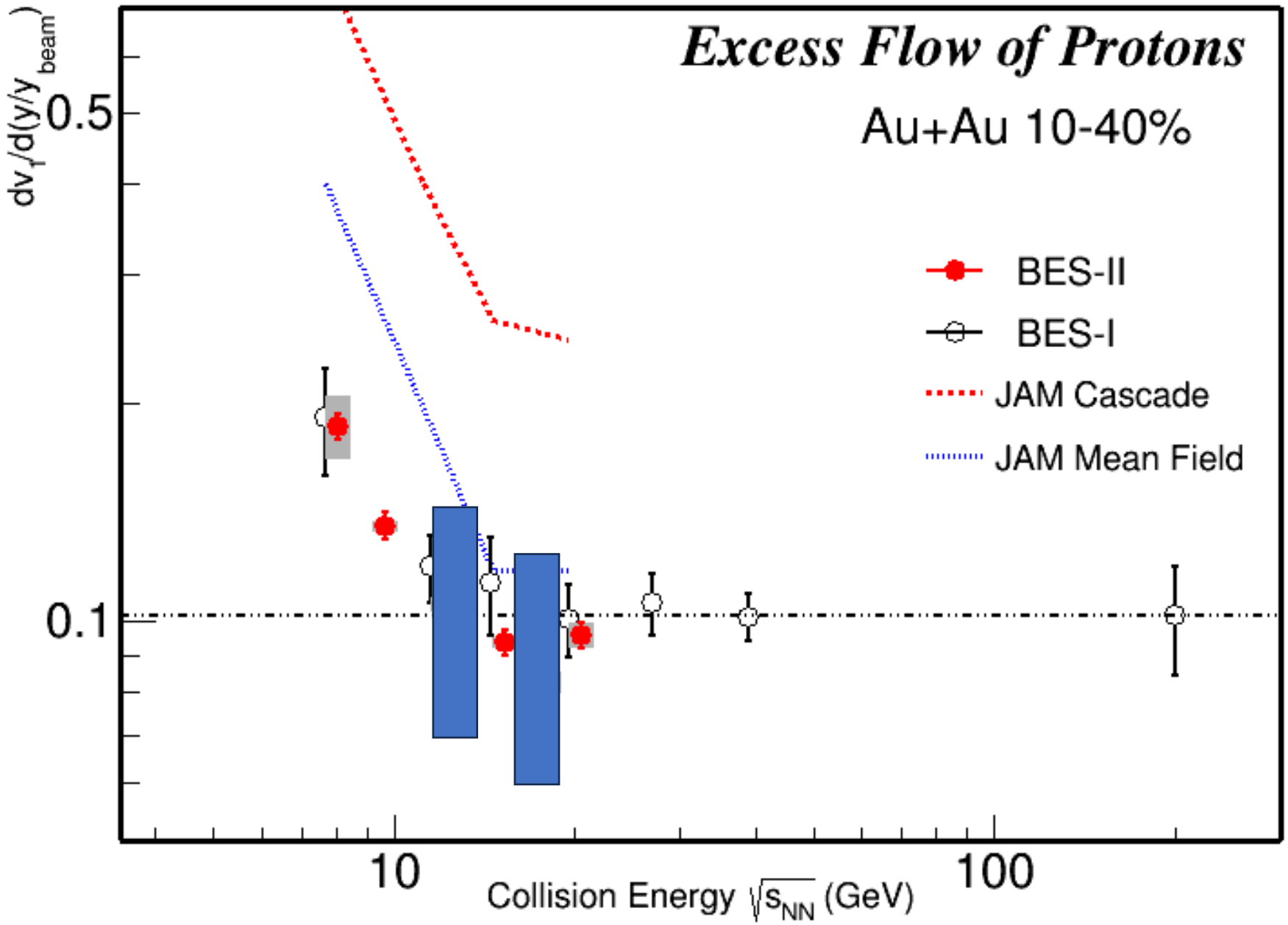




Not Quite Ready

Directed Flow vs. Collision Energy




Excess Flow of Protons
Au+Au 10-40%
BES-II
BES-I
JAM Cascade
JAM Mean Field
$dv_1/d(y/y_{beam})$
0.5
0.1
10
100
Collision Energy $\sqrt{s_{NN}}$ (GeV)

Backup

Systematics 7.7 GeV

$$Barlow\ Test = \frac{|Y_i - Y_{df}|}{\sqrt{|\sigma_i^2 - \sigma_{df}^2|}}$$

$$Barlow\ Error = \sqrt{(Y_i - Y_{df})^2 - |\sigma_i^2 - \sigma_{df}^2|}$$

7.7 GeV proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	1.37E-02	2.01E-04		
dca<1	1.40E-02	2.08E-04	5.55	2.91E-04
dca<2	1.38E-02	2.02E-04	1.70	
nhitsfit>18	1.37E-02	2.01E-04	0.81	0.00E+00
nhitsfit>20	1.37E-02	2.01E-04	2.73	1.42E-05
nsigma cut <2	1.37E-02	2.02E-04	0.06	0.00E+00
				0.00E+00
loose mass	1.57E-02	1.92E-04	34.18	2.02E-03
Total:				2.04E-03

7.7 GeV anti-proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-5.30E-02	2.51E-03		
dca<1	-5.43E-02	2.70E-03	1.30E+00	8.35E-04
dca<2	-5.29E-02	2.54E-03	3.23E-01	0.00E+00
nhitsfit>18	-5.29E-02	2.51E-03	1.97E+00	5.62E-05
nhitsfit>20	-5.29E-02	2.51E-03	1.00E+00	
nsigma cut <2	-5.29E-02	2.52E-03	3.60E-01	0.00E+00
loose mass	-5.04E-02	2.34E-03	2.92E+00	2.46E-03
Total:				2.59E-03

excess proton	7.7 GeV	difference	sum square
origional	6.65E-02+/-2.75E-03		
dca<1	7.00E-02	0.0035387	1.25224E-05
dca<2	6.76E-02	0.0010494	0
nhitsfit>18	6.64E-02	0.0001024	0
nhitsfit>20	6.72E-02	0.0007235	5.23452E-07
nsigma cut <2.5	6.14E-02	0.0051077	2.60886E-05
loose mass	6.85E-02	0.0019734	3.89431E-06
		Total:	4.30288E-05
			0.006559631

7.7 GeV net proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	1.41E-02	4.06E-04		
dca<1	1.44E-02	4.20E-04	2.55	2.49E-04
dca<2	1.42E-02	4.08E-04	0.70	0.00E+00
nhitsfit>18	1.41E-02	4.06E-04	0.46	0.00E+00
nhitsfit>20	1.41E-02	4.06E-04	1.39	1.09E-05
nsigma cut <2	1.41E-02	4.08E-04	0.03	0.00E+00
loose mass	1.62E-02	3.88E-04	17.15	2.04E-03
Total:				2.05E-03

Systematics 11.5 GeV

$$Barlow\ Test = \frac{|Y_i - Y_{df}|}{\sqrt{|\sigma_i^2 - \sigma_{df}^2|}}$$

$$Barlow\ Error = \sqrt{(Y_i - Y_{df})^2 - |\sigma_i^2 - \sigma_{df}^2|}$$

11.5 GeV				
proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-5.16E-03	1.10E-04		
dca<1	-4.85E-03	1.16E-04	9.12	3.10E-04
dca<2	-5.08E-03	1.11E-04	5.83	
nhitsfit>18	-5.16E-03	1.11E-04	1.04	
nhitsfit>20	-5.14E-03	1.11E-04	2.35	1.82E-05
nsigma cut <2	-4.96E-03	1.15E-04	6.24	2.03E-04
nsigma cut <3	-5.33E-03	1.08E-04	7.10	
loose mass	-5.16E-03	1.10E-04		
Total:				5.32E-04

11.5 GeV				
anti-proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-3.72E-02	6.10E-04		
dca<1	-3.77E-02	6.65E-04	1.98	4.53E-04
dca<2	-3.75E-02	6.21E-04	2.10	
nhitsfit>18	-3.73E-02	6.13E-04	1.80	
nhitsfit>20	-3.73E-02	6.15E-04	1.57	9.36E-05
nsigma cut <2	-3.76E-02	6.39E-04	2.19	3.70E-04
nsigma cut <3	-3.72E-02	5.92E-04	0.22	0.00E+00
loose mass	-3.72E-02	6.10E-04		
Total:				5.93E-04

11.5 GeV				
excess proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	3.31E-02	1.28E-03		
dca<1	3.39E-02	1.39E-03	1.42	5.45E-04
dca<2	3.34E-02	1.30E-03	1.34	
nhitsfit>18	3.32E-02	1.29E-03	0.89	0.00E+00
nhitsfit>20	3.32E-02	1.29E-03	0.84	0.00E+00
nsigma cut <2	3.37E-02	1.34E-03	1.58	4.85E-04
nsigma cut <3	3.30E-02	1.24E-03	0.35	0.00E+00
loose mass	3.31E-02	1.28E-03		
Total:				7.30E-04

11.5 GeV				
net proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-4.09E-03	2.32E-04		
dca<1	-3.84E-03	2.42E-04	3.66	2.42E-04
dca<2	-4.02E-03	2.34E-04	2.61	
nhitsfit>18	-4.09E-03	2.32E-04	0.28	0.00E+00
nhitsfit>20	-4.08E-03	2.32E-04	0.85	0.00E+00
nsigma cut <2	-3.88E-03	2.42E-04	3.17	2.07E-04
nsigma cut <3	-4.24E-03	2.27E-04	3.15	
loose mass	-4.09E-03	2.32E-04		
Total:				3.18E-04

Systematics 14.6 GeV

$$Barlow\ Test = \frac{|Y_i - Y_{df}|}{\sqrt{|\sigma_i^2 - \sigma_{df}^2|}}$$

$$Barlow\ Error = \sqrt{(Y_i - Y_{df})^2 - |\sigma_i^2 - \sigma_{df}^2|}$$

14.6 GeV				
proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-7.39E-03	1.26E-04		
dca<1	-7.17E-03	1.32E-04	5.91	2.17E-04
dca<2	-7.33E-03	1.27E-04	4.23	
nhitsfit>18	-7.39E-03	1.26E-04	0.28	0.00E+00
nhitsfit>20	-7.40E-03	1.26E-04	2.61	9.06E-06
nsigma cut <2	-7.33E-03	1.28E-04	3.18	6.32E-05
loose mass	-6.90E-03	1.21E-04	13.52	4.93E-04
Total:				7.83E-04

14.6 GeV				
anti-proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-3.31E-02	5.21E-04		
dca<1	-3.34E-02	5.55E-04	1.49	2.14E-04
dca<2	-3.31E-02	5.26E-04	0.39	0.00E+00
nhitsfit>18	-3.31E-02	5.21E-04	1.64	9.97E-06
nhitsfit>20	-3.31E-02	5.21E-04	0.02	0.00E+00
nsigma cut <2	-3.30E-02	5.27E-04	0.53	0.00E+00
loose mass	-3.25E-02	4.91E-04	3.54	5.88E-04
Total:				8.11E-04

excess proton	14.6 GeV	stat		
origional	2.72578E-02	1.07E-03		
dca<1	2.77211E-02	0.0004633	0.000463	2.14647E-07
dca<2	2.72850E-02	2.72E-05		0
nhitsfit>18	2.72438E-02	1.4E-05	1.4E-05	1.96E-10
nhitsfit>20	2.72473E-02	1.05E-05		0
nsigma cut <2.5	2.72835E-02	0.0000257	2.57E-05	6.6049E-10
loose mass	2.71796E-02	7.82E-05	7.82E-05	6.11524E-09
				2.21619E-07
				0.000470764

14.6 GeV				
net proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-5.81E-03	2.76E-04		
dca<1	-5.63E-03	2.86E-04	2.28	1.59E-04
dca<2	-5.75E-03	2.77E-04	1.75	
nhitsfit>18	-5.81E-03	2.76E-04	0.29	0.00E+00
nhitsfit>20	-5.82E-03	2.76E-04	1.23	5.93E-06
nsigma cut <2	-5.74E-03	2.79E-04	1.53	5.33E-05
loose mass	-5.27E-03	2.64E-04	6.97	5.34E-04
Total:				7.52E-04

Systematics 17.3 GeV

$$Barlow\ Test = \frac{|Y_i - Y_{df}|}{\sqrt{|\sigma_i^2 - \sigma_{df}^2|}}$$

$$Barlow\ Error = \sqrt{(Y_i - Y_{df})^2 - |\sigma_i^2 - \sigma_{df}^2|}$$

17.3 GeV				
proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-9.04E-03	1.54E-04		
dca<1	-8.66E-03	1.63E-04	7.42	3.81E-04
dca<2	-8.94E-03	1.56E-04	4.58	
nhitsfit>18	-9.05E-03	1.54E-04	0.97	0.00E+00
nhitsfit>20	-9.06E-03	1.54E-04	1.79	1.76E-05
nsigma cut <2	-8.81E-03	1.60E-04	5.28	2.24E-04
nsigma cut <3	-9.20E-03	1.51E-04	5.19	
loose mass	-9.04E-03	1.54E-04		
Total:				6.23E-04

17.3 GeV				
anti-proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-2.98E-02	5.10E-04		
dca<1	-3.04E-02	5.52E-04	2.59	5.03E-04
dca<2	-2.99E-02	5.18E-04	1.13	
nhitsfit>18	-2.99E-02	5.12E-04	0.92	0.00E+00
nhitsfit>20	-2.99E-02	5.13E-04	1.72	7.38E-05
nsigma cut <2	-2.98E-02	5.32E-04	0.34	0.00E+00
nsigma cut <3	-2.99E-02	4.98E-04	0.97	0.00E+00
loose mass	-2.98E-02	5.10E-04		
Total:				5.77E-04

17.3 GeV				
excess proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	2.28E-02	1.17E-03		
dca<1	2.37E-02	1.26E-03	1.97	7.81E-04
dca<2	2.30E-02	1.19E-03	1.03	
nhitsfit>18	2.28E-02	1.17E-03	0.29	0.00E+00
nhitsfit>20	2.29E-02	1.18E-03	0.58	0.00E+00
nsigma cut <2	2.30E-02	1.22E-03	0.50	0.00E+00
nsigma cut <3	2.28E-02	1.14E-03	0.08	0.00E+00
loose mass	2.28E-02	1.17E-03		
Total:				7.81E-04

17.3 GeV				
net proton	**Slope**	**Error**	**Barlow Test**	**Barlow Error**
origional	-6.99E-03	3.53E-04		
dca<1	-6.63E-03	3.70E-04	3.26	3.42E-04
dca<2	-6.89E-03	3.56E-04	2.11	
nhitsfit>18	-7.00E-03	3.53E-04	0.76	0.00E+00
nhitsfit>20	-7.01E-03	3.54E-04	1.05	7.67E-06
nsigma cut <2	-6.76E-03	3.66E-04	2.34	2.06E-04
nsigma cut <3	-7.12E-03	3.47E-04	2.05	
loose mass	-6.99E-03	3.53E-04		
Total:				5.56E-04

Bad Run list for 7.7 GeV (from QA group)

22031054, 22033001, 22035002, 22038009, 22039010, 22039013, 22039028, 22042004, 22043046,22043047, 22044003, 22044004, 22044005, 22046006, 22046007, 22046012, 22047008, 22048002,22048007, 22048040, 22048042, 22049026, 22049027, 22049029, 22050003, 22050006, 22050016,22050038, 22050040, 22050044, 22050045, 22051014, 22052032, 22052033, 22052035, 22052036,22052048, 22053022, 22054007, 22054022, 22054028, 22054030, 22054042, 22055023, 22057010,22058037, 22059005, 22061012, 22061015, 22062034, 22062035, 22062036, 22063014, 22064025,22064038, 22065014, 22065015, 22067039, 22068012, 22068041, 22069030, 22069032, 22069033,22069034, 22069040, 22070001, 22070002, 22070003, 22070004, 22070005, 22070006, 22070007,22070008, 22070009, 22070010, 22070011, 22070012, 22070014, 22070040, 22070041, 22071036,22074009, 22074042, 22076033, 22076034, 22077050, 22078016, 22078032, 22079027, 22084029,22084035, 22085009, 22085021, 22086027, 22087027, 22088034, 22091018, 22091022, 22091025,22093029, 22094046, 22095027, 22096003, 22096037, 22097016, 22097030, 22098054, 22099024,22099042, 22100045, 22101016, 22101017, 22101018, 22101022, 22102034, 22103027, 22103032,22104027, 22105030, 22106032, 22108050, 22109032, 22110025, 22111047, 22112021, 22113001,22113029, 22114030, 22115004, 22115008, 22115019, 22115032, 22116007, 22116008, 22116025,22116026, 22116030, 22117023, 22118058

Bad Run list for 9.2 GeV (from QA group)

21036025, 21036028, 21036032, 21037025, 21037030, 21037031, 21037047, 21037052, 21038020, 21038021, 21038029, 21038031, 21038033, 21038035, 21038039, 21038042, 21038046, 21039025, 21039029, 21040007, 21056032, 21058027, 21058028, 21058029, 21058030, 21060015, 21060016, 21060021, 21060026, 21062015, 21062020, 21062021, 21064004, 21064024, 21064041, 21064047, 21065026, 21065042, 21066027, 21066028, 21067020, 21068024, 21068027, 21068030, 21069005, 21069006, 21069014, 21069017, 21069035, 21069038, 21069040, 21069042, 21069043, 21070011, 21071002, 21072016, 21073007, 21073008, 21073032, 21076004, 21076029, 21077024, 21078001, 21078002, 21078006, 21078020, 21080027, 21169035, 21169036, 21169037, 21169038, 21169039, 21170018, 21171007, 21171031, 21171032, 21171033, 21172032, 21174049, 21174050, 21175009, 21176020, 21176024, 21176029, 21177019, 21177020, 21177021, 21177022, 21177032, 21178013, 21179001, 21179018, 21179020, 21179026, 21180008, 21180025, 21180027, 21181024, 21181025, 21181026, 21181033, 21182037, 21182038, 21182041, 21184025, 21184026, 21186026, 21186027, 21187032, 21188017, 21188027, 21189039, 21189040, 21190053, 21191008, 21192018, 21193009, 21193027, 21194002, 21196004, 21197005, 21198002, 21203001, 21203002, 21203003, 21203017, 21205002, 21205020, 21205023, 21206002, 21206005, 21206007, 21206008, 21208027, 21209009, 21210009, 21210046, 21211004, 21211009, 21213004, 21213005, 21213006, 21213013, 21213014, 21213016, 21213017, 21213018, 21213019, 21213020, 21217001, 21217010, 21217020, 21218001, 21218002, 21218003, 21218004, 21218005, 21218006, 21218007, 21218013, 21218014, 21218015, 21218016, 21218017, 21219007, 21219008, 21219009, 21219010, 21220015, 21222026, 21223030, 21225035, 21225040, 21225041, 21225042, 21225045, 21226003, 21227007, 21227008, 21227021, 21228020, 21229006, 21229041, 21233002, 21233010, 21235015, 21235033, 21235035, 21237014, 21237021, 21237022, 21237023, 21239010, 21241015, 21241016, 21242028, 21243007, 21243008, 21243033, 21243038, 21244023, 21244024, 21245003

Bad Run list for 11.5 GeV (from QA group)

20344004, 20344006, 20344007, 20344008, 20344009, 20344013, 20344014, 20344015, 20347037, 20347035, 20347036, 20347038, 20347039, 20348023, 20351062, 20351067, 20354051, 20354053, 20355004, 20356005, 20356007, 20356020, 20356022, 20356023, 20357022, 20361014, 20361017, 20363010, 21003011, 21004021, 21005039, 21005040, 21005041, 21006008, 21006029, 21006031, 21007034, 21010036, 21011001, 21011004, 21012034, 21012035, 21013016, 21014027, 21015031, 21015029, 21017048, 21019016, 21019020, 21019069, 21019073, 21021009, 21021010, 21021011, 21025042, 21041025, 21041026, 21050043, 21045044, 21046005, 21046045, 21046046, 21046047, 21046048, 21048061, 21050044, 21050045, 21050046, 21050047, 21050048, 21050049, 21050050, 21050052, 21050053, 21050054, 21050055, 21050056, 21050057, 21050058, 21052039, 21053060, 21053061, 21053062, 21053063, 21053064

Bad Run List 14.6 GeV (from QA group)

20094053, 20094054, 20096025, 20099032, 20099033, 20099034, 20099044, 20099048, 20099052, 20101002, 20102001, 20102002, 20102003, 20102013, 20102014, 20102035, 20102036, 20102053, 20103002, 20103003, 20103005, 20103006, 20104016, 20108010, 20108012, 20108013, 20110001, 20110022, 20111020, 20111047, 20113055, 20113063, 20113066, 20113067, 20113068, 20113069, 20113070, 20113081, 20113088, 20114025, 20114026, 20114031, 20117013, 20117055, 20119005, 20119053, 20120047, 20123015, 20123016, 20123018, 20123038, 20124001, 20124037, 20124051, 20124058, 20124059, 20124060, 20124062, 20124064, 20124066, 20124068, 20124070, 20124072, 20124074, 20124077, 20124079, 20125003, 20125005, 20125007, 20125008, 20125010, 20125011, 20125013, 20125015, 20125016, 20125018, 20125020, 20125023, 20125025, 20125027, 20125028, 20125029, 20125030, 20125031, 20125033, 20125034, 20125035, 20125036, 20125038, 20125039, 20125041, 20125044, 20125047, 20125048, 20125049, 20125050, 20125053, 20125055, 20125057, 20125058, 20125059, 20126004, 20126005, 20126006, 20126007, 20126008, 20126010, 20126013, 20126014, 20126015, 20126017, 20126019, 20126021, 20126025, 20126027, 20126029, 20127006, 20127007, 20127010, 20127012, 20128043, 20131015, 20131028, 20132002, 20132012, 20134024, 20136001, 20136003, 20136006, 20136008, 20137005, 20137011, 20137013, 20137015, 20137017, 20138002, 20138015, 20138039, 20139033, 20141002, 20143007, 20144038, 20147022, 20148007, 20148031, 20150004, 20151003, 20151006, 20151012, 20152026, 20152028, 20152029, 20152030,20094051, 20094055, 20094058, 20094062, 20094063, 20094064, 20094065, 20094066, 20094069, 20094075, 20094078, 20094082, 20094092, 20094100, 20094103, 20095007, 20095011, 20095014, 20095015, 20095017, 20096003, 20096006, 20096012, 20096013, 20096019, 20096028, 20097002, 20097003, 20097007, 20097010, 20097016, 20097020, 20097025, 20097032, 20098001, 20098004, 20098007, 20098011, 20098014, 20098018, 20099020, 20099031, 20099041, 20099042, 20100006, 20100011, 20100018, 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20131039, 20131041, 20131043, 20131045, 20132001, 20132003, 20132005, 20132007, 20132009, 20132011, 20132013, 20132015, 20132017, 20132020, 20132024, 20132026, 20132029, 20132033, 20132035, 20132038, 20132040, 20132044, 20132050, 20132054, 20132058, 20133001, 20133003, 20133005, 20133008, 20133012, 20133015, 20133016, 20133018, 20133020, 20134002, 20134010, 20134012, 20134014, 20134019, 20134021, 20134025, 20134035, 20134038, 20134040, 20134043, 20134045, 20134047, 20134049, 20134051, 20134053, 20134055, 20135001, 20135003, 20135007, 20135010, 20135012,

Bad Run List 17.3 GeV (from QA group)

22145017, 22145020, 22145022, 22145027, 22145044, 22145047, 22146011, 22147001, 22148016, 22150030, 22151020, 22152012, 22152016, 22152017, 22152018, 22153004, 22154004, 22155032, 22155033, 22156024, 22156026, 22156031, 22157014, 22157020, 22157022, 22158012

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