u-Channel Analysis Progress

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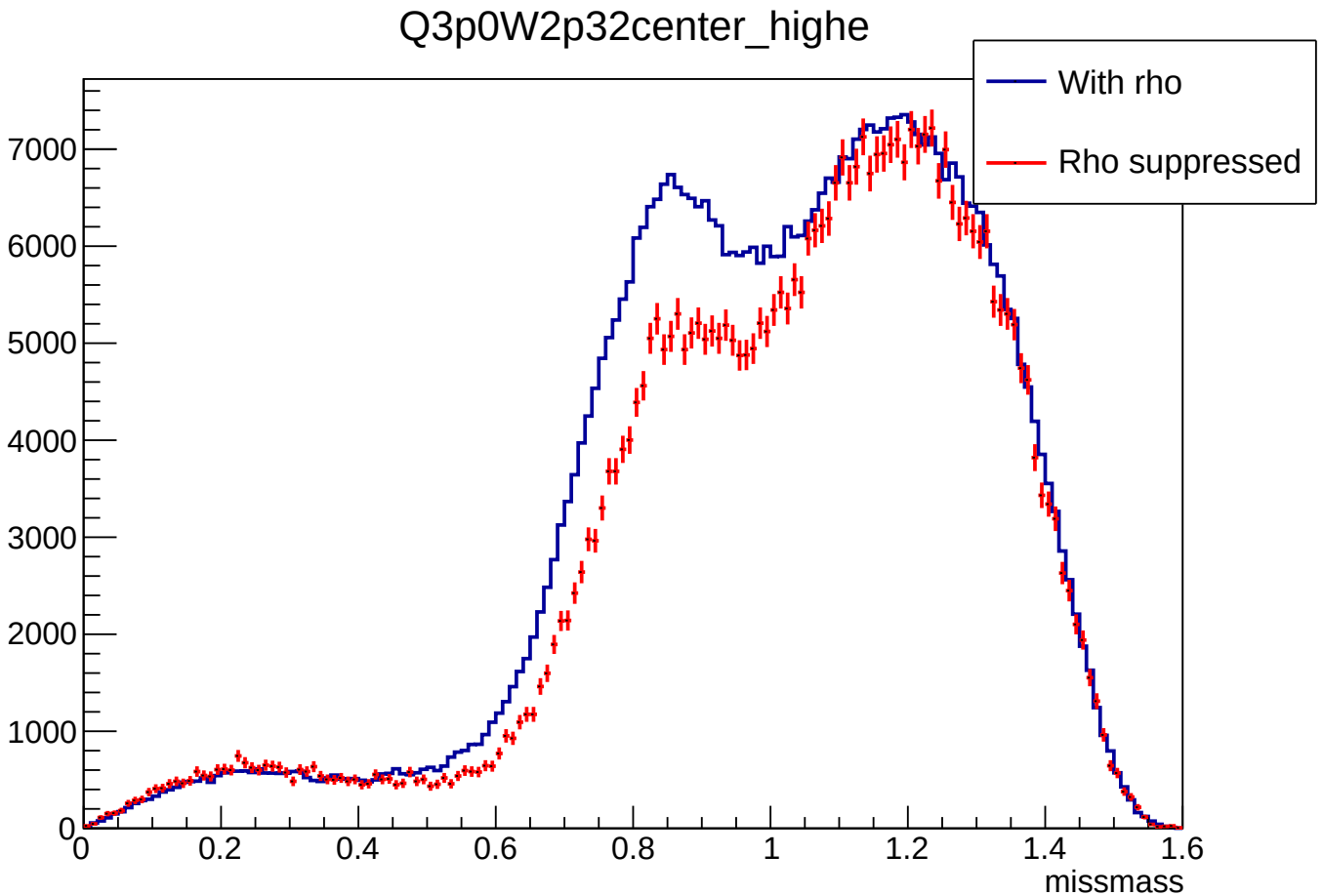
Pythia

- Looking at Pythia for Q^2=3, W=2.32: double bump structure
- Asked Henry Klest: he suspects it is the $\rho(770)$ interfering with $\pi^+\pi^-$
- To get just phase space, I reject exclusive events with a η, ω, ρ, η', or ϕ in the final state
- Extra bump could be ρ resonance in multi-pion without a ρ in the final state
- Henry suggests: run Pythia while allowing exclusive ρ

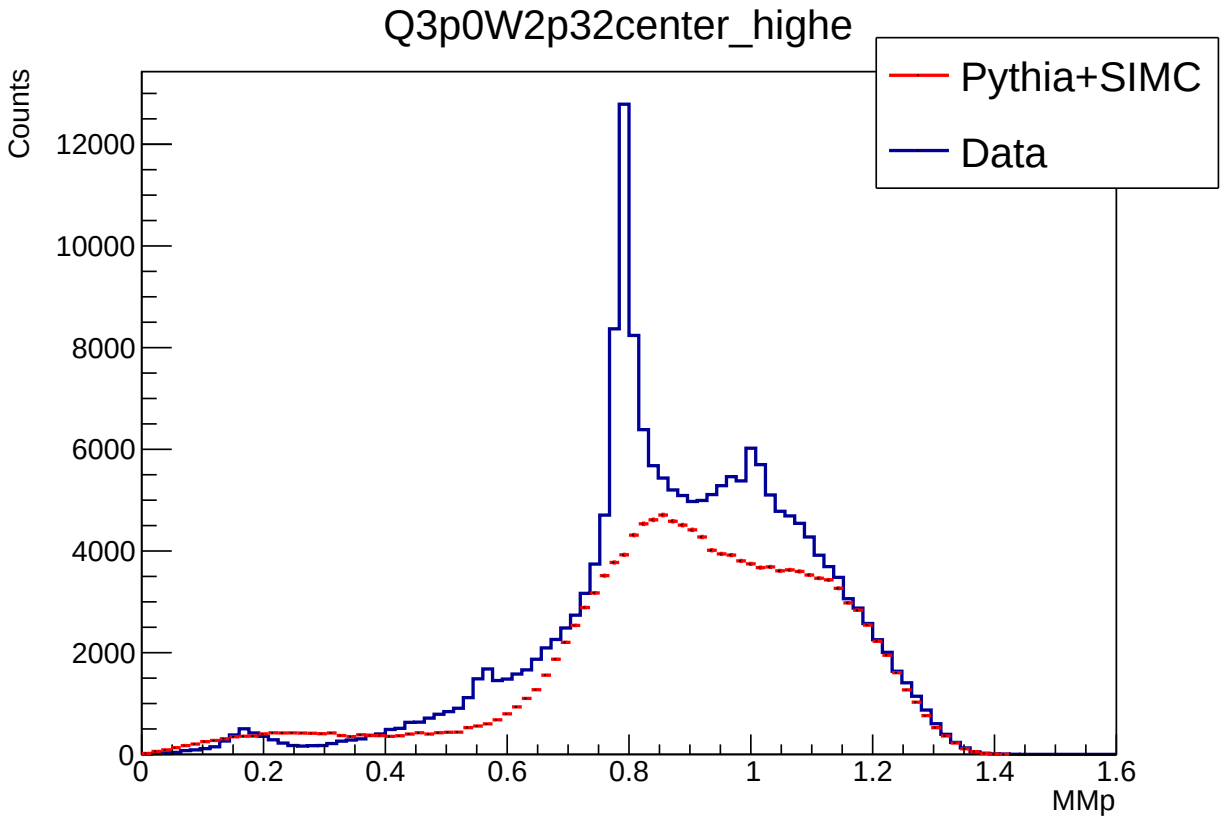
Pythia: Enable Rho

- Allow ρ: it seems the second bump is indeed ρ: suppression of exclusive ρ not fully working



Pythia: Agreement with Data

- Allow ρ: how does the new spectrum compare to data?
- Seems to over-estimate ρ compared to phase space



TRY:

- Blocking diffractive ρ 9900110
- **Blocking** $\rho(770)^+$ **213**

LTSep Statistics

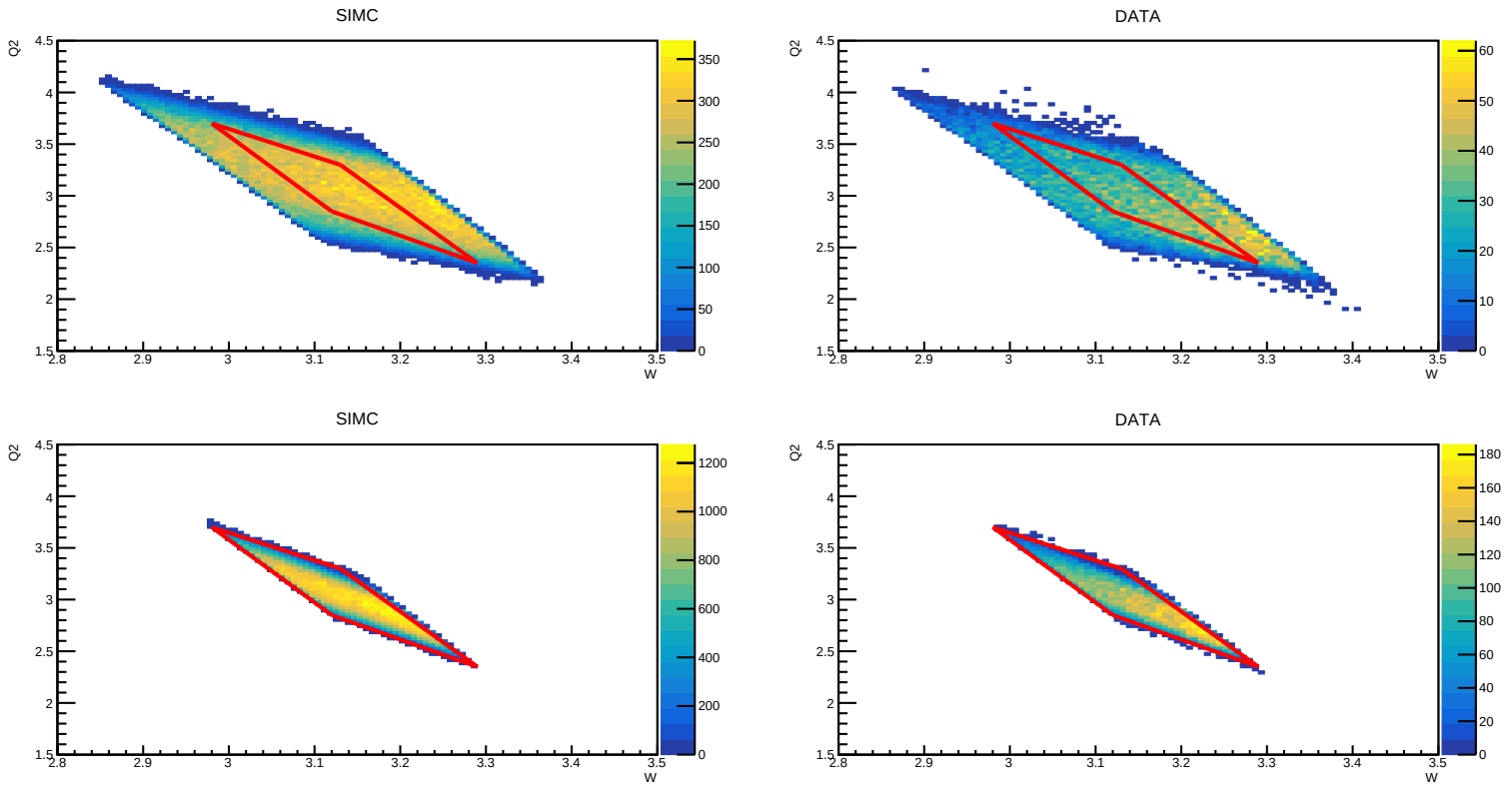
- Previously showed rough statistics per setting, 1 u-bin and 8 ϕ-bins
- This did not have a diamond cut → overestimated statistics at high ϵ

Data set Phi bin:	1	2	3	4	5	6	7	8
Q2p1W2p95center_highe	4562	6768	5616	2599	2581	5680	6050	4403
Q2p1W2p95left_highe	10329	6037	497	68	36	588	6065	10848
Q2p1W2p95right_highe	121	485	4474	9269	9619	4044	501	132
Q2p1W2p95center_lowe	361	387	138	42	45	192	396	415
Q2p1W2p95left_lowe	959	81	0	0	0	0	78	952
Q3p0W2p32center_highe	16911	25288	27341	18712	18748	27266	24764	17261
Q3p0W2p32left_highe	18722	18198	9690	2610	2677	9954	18027	18982
Q3p0W2p32right_highe	1047	3027	10187	15971	16298	9823	2838	1031
Q3p0W2p32center_lowe	1623	2235	1907	913	753	1078	1255	1279
Q3p0W2p32left_lowe	4761	1112	18	0	2	16	691	3752
Q3p0W3p14center_highe	2212	3109	2542	1349	1526	2847	2965	2318
Q3p0W3p14left_highe	6599	2326	85	5	7	53	2396	6421
Q3p0W3p14right_highe	15	59	1197	3975	4280	1430	58	22
Q3p0W3p14center_lowe	790	1274	1102	523	669	1208	1380	872
Q3p0W3p14left_lowe	2999	285	0	0	0	2	447	3107
Q4p4W2p74center_highe	1373	2184	1969	1003	1106	1852	2012	1565
Q4p4W2p74left_highe	3113	1294	111	10	21	103	1135	3049
Q4p4W2p74right_highe	17	182	1231	3102	3139	999	133	40
Q4p4W2p74center_lowe	973	1410	1302	655	759	1328	1601	1008
Q4p4W2p74left_lowe	3302	622	2	0	0	3	614	3118
Q5p5W3p02center_highe	387	776	555	425	356	580	925	491
Q5p5W3p02left_highe	748	226	2	0	0	0	166	858
Q5p5W3p02right_highe	1	3	220	1157	1306	303	2	0
Q5p5W3p02center_lowe	161	105	59	15	39	127	116	157
Q5p5W3p02left_lowe	201	16	0	0	0	0	32	246

Sample Diamond Cut

Q^2=3.0, W=3.14

(W,Q^2): (3.29, 2.35) – (3.12,2.85) – (2.98,3.70) – (3.13,3.30)



Updated Statistics

Data set Phi bin:	1	2	3	4	5	6	7	8
Q2p1W2p95center_highe	206	531	496	150	144	635	654	240
Q2p1W2p95left_highe	917	568	1	0	0	2	470	1077
Q2p1W2p95right_highe	0	3	255	842	1014	241	2	0
Q2p1W2p95center_lowe	361	387	138	42	45	192	396	415
Q2p1W2p95left_lowe	959	81	0	0	0	0	78	952
Q3p0W2p32center_highe	2056	5610	7704	1919	2046	7066	6051	1874
Q3p0W2p32left_highe	4770	4774	230	15	9	235	4528	4620
Q3p0W2p32right_highe	7	61	2173	3759	3757	2140	52	17
Q3p0W2p32center_lowe	1623	2235	1907	913	753	1078	1255	1279
Q3p0W2p32left_lowe	4761	1112	18	0	2	16	691	3752
Q3p0W3p14center_highe	643	1129	940	352	526	1017	1022	621
Q3p0W3p14left_highe	2139	729	2	0	0	4	770	2302
Q3p0W3p14right_highe	0	5	255	1302	1529	354	1	2
Q3p0W3p14center_lowe	790	1274	1102	523	669	1208	1380	872
Q3p0W3p14left_lowe	2999	285	0	0	0	2	447	3107
Q4p4W2p74center_highe	518	906	853	279	349	846	1000	626
Q4p4W2p74left_highe	1347	424	10	0	0	1	390	1207
Q4p4W2p74right_highe	3	19	472	1465	1447	366	14	4
Q4p4W2p74center_lowe	973	1410	1302	655	759	1328	1601	1008
Q4p4W2p74left_lowe	3302	622	2	0	0	3	614	3118
Q5p5W3p02center_highe	90	114	91	95	59	134	195	59
Q5p5W3p02left_highe	174	44	0	0	0	0	44	242
Q5p5W3p02right_highe	0	0	18	223	249	30	0	0
Q5p5W3p02center_lowe	161	105	59	15	39	127	116	157
Q5p5W3p02left_lowe	201	16	0	0	0	0	32	246

Summary of Settings

(Q^2,x_B)	RF high ϵ	Resolution	Pythia	Statistics	Priority
(2.1,0.21)	No	good	good	okay	4
(3.0,0.25)	Partial	good	good	good	1
(3.0,0.40)	No	poor	weird	best	2
(4.4,0.40)	No	good	good	okay	3
(5.5,0.40)	Yes	good	good	poor	N/A

- Only setting for which all high ϵ data has functional RF (5.5,0.40) has insufficient statistics for an LT separation
- Best statistics is for the worst behaved setting
- Setting Q^2=3, W=3.14, x_B=0.25 best balance of characteristics

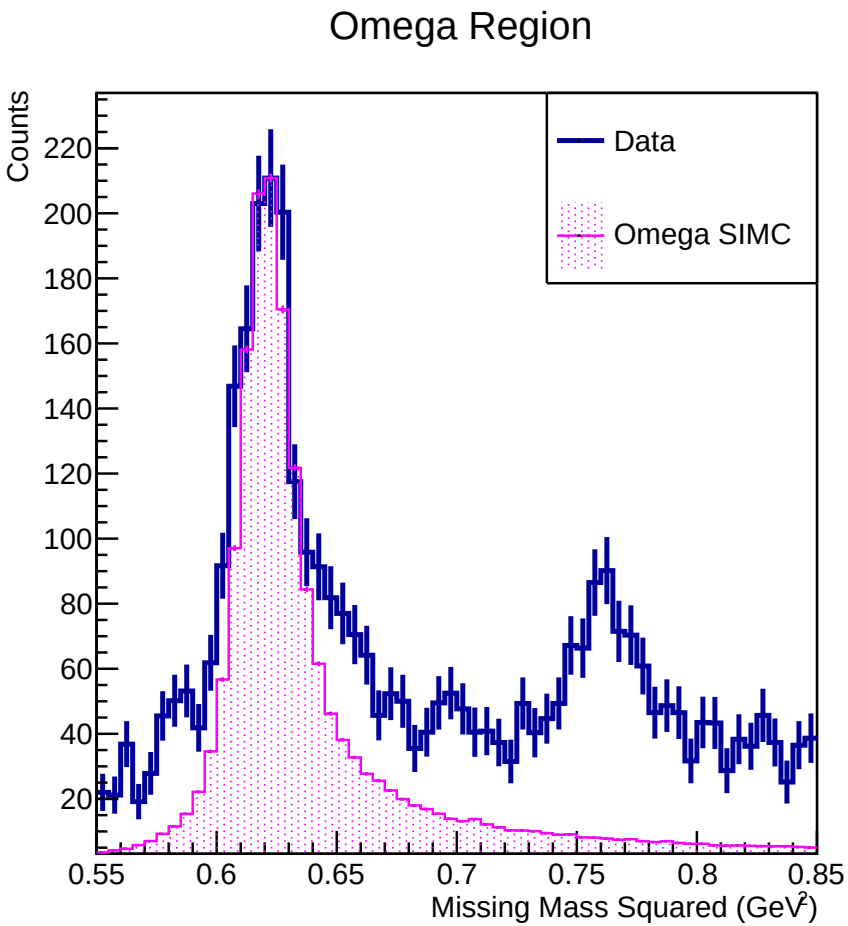
Future Plans

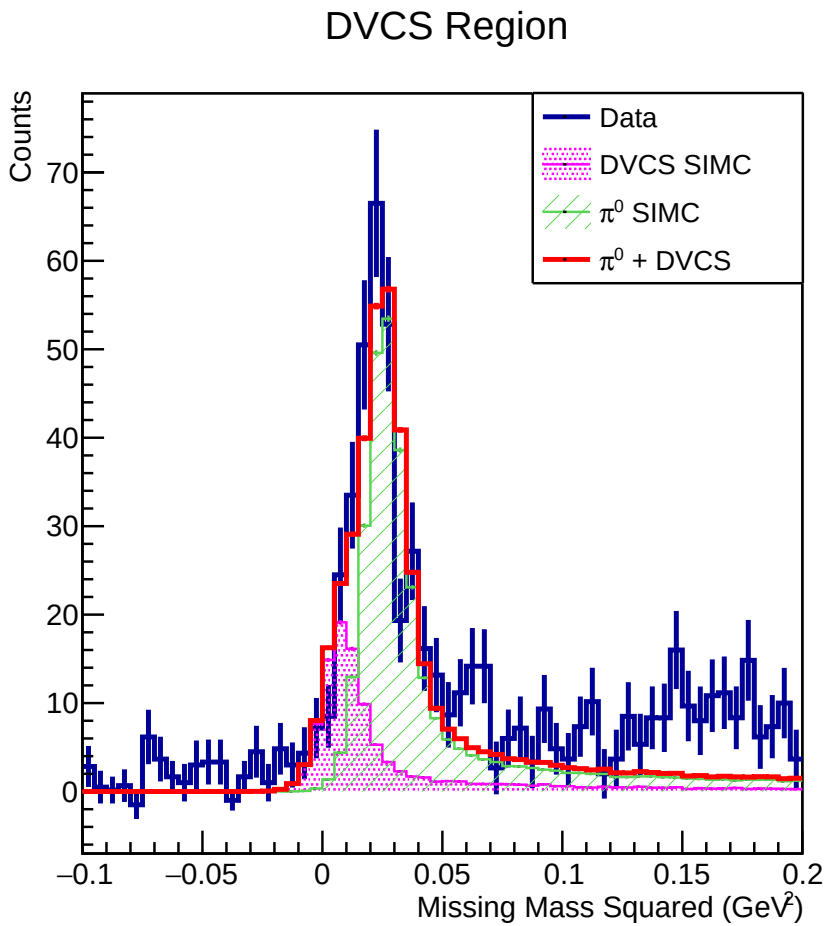
- Off for holidays Dec 20 – Jan 4
- Next week: writing committee report for meeting in January
- Submitting new replay with the xp offset discussed in last meeting

COMMITTEE REPORT

- Progress: PID, shape study, Pythia
- Feasibility: asymmetry (no), Rosenbluth (mostly), DVCS (maybe)
- Miscellaneous: paper, SHMS Geant4
- Future plans:
  - Finalize PID studies
  - $u - \phi$ binning
  - Binned shape study
  - Set up LTsep framework
  - Preliminary LTsep before Junaid & Nathan graduate

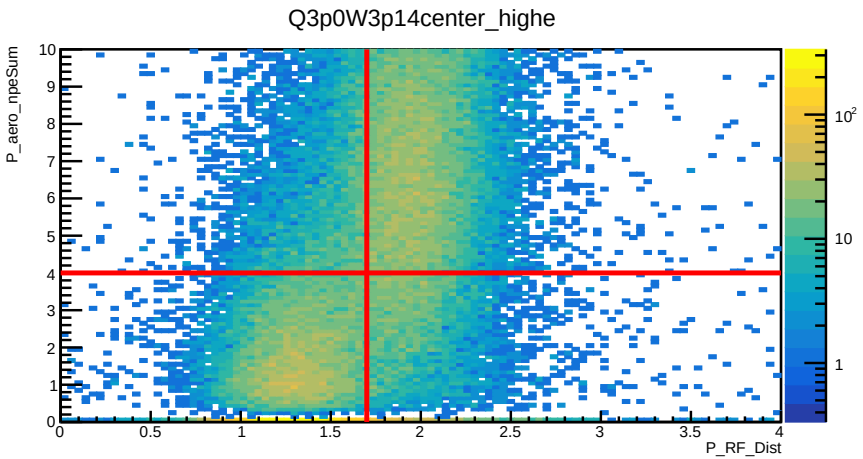
Modified DVCS Plot

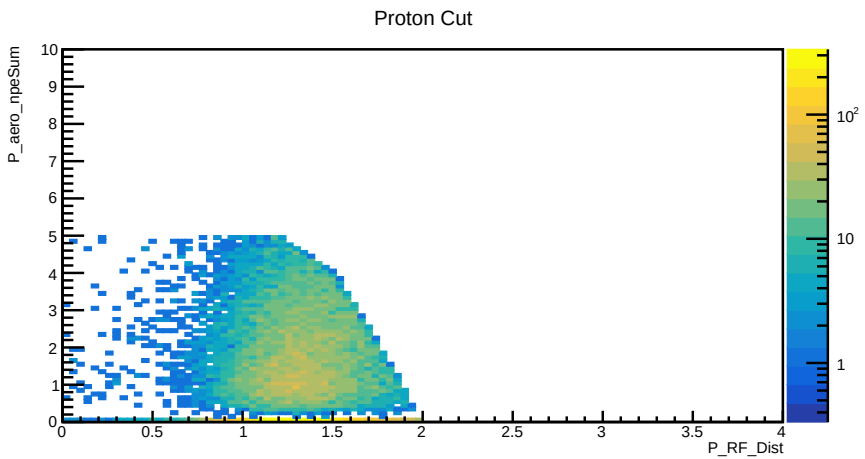


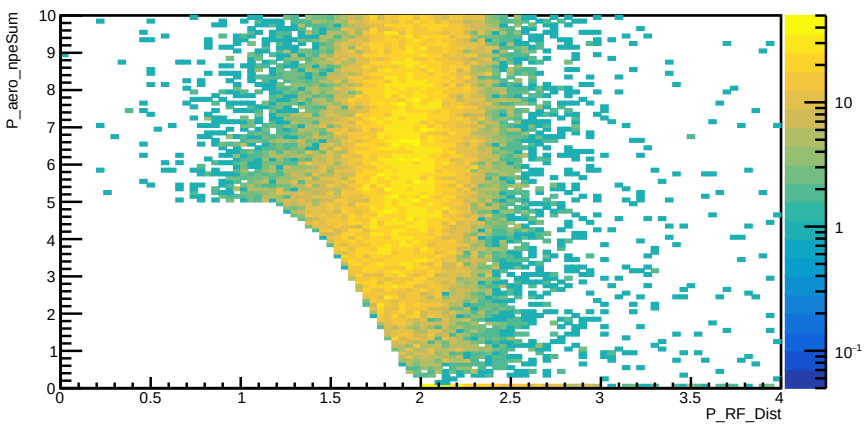


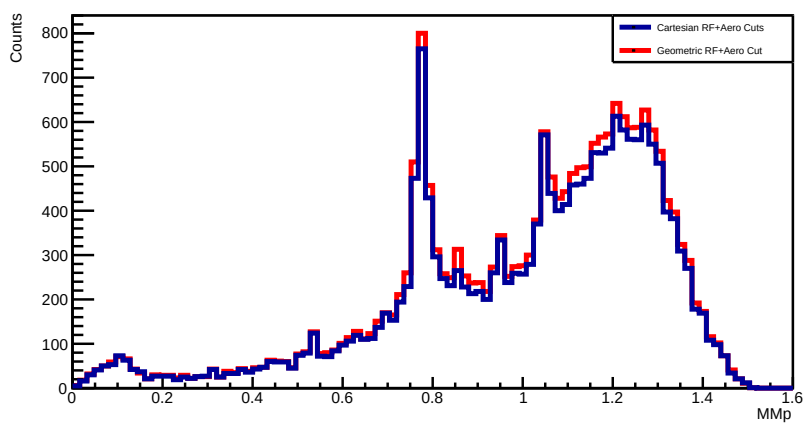
At Bill's request, let ROOT fit the two contributions to the data: 25% DVCS (100 counts DVCS, 300 π^+) at Q^2=3, W=3.14, SHMS center, low ϵ

Geometric PID Cut

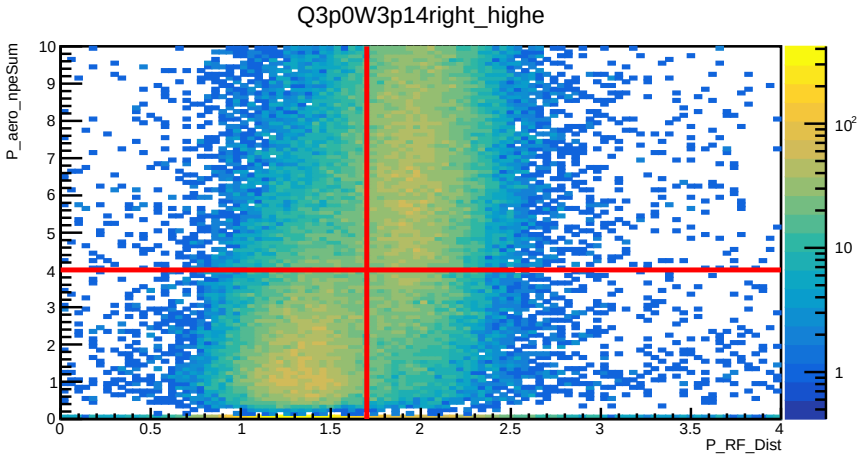


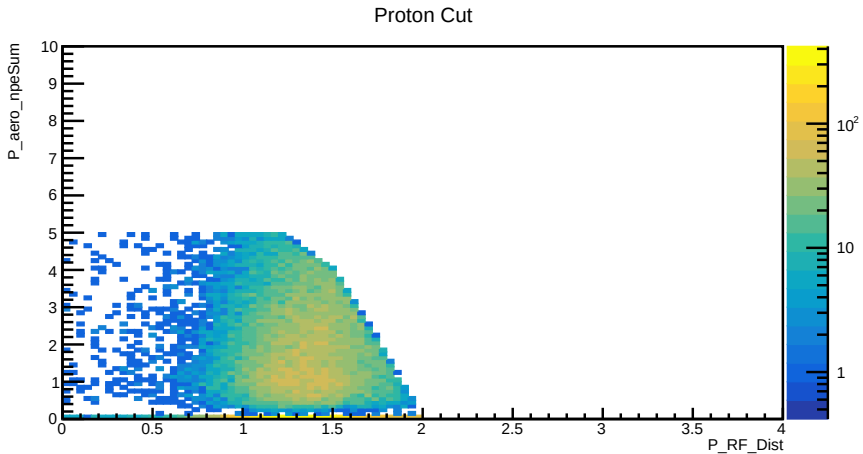


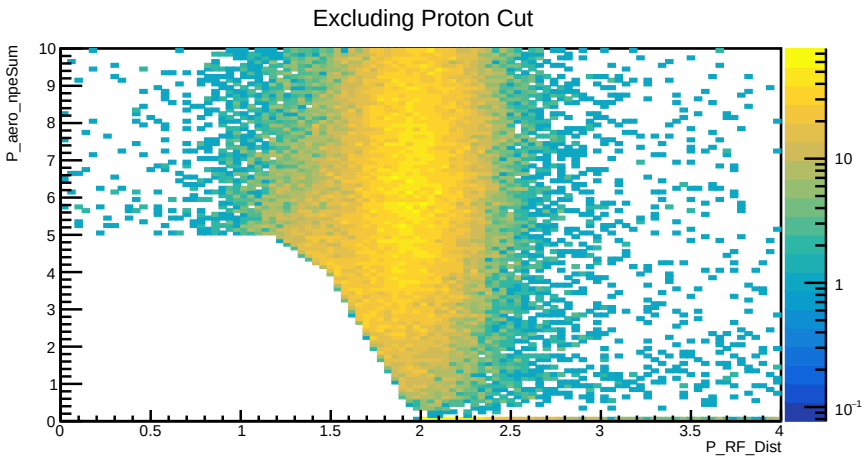


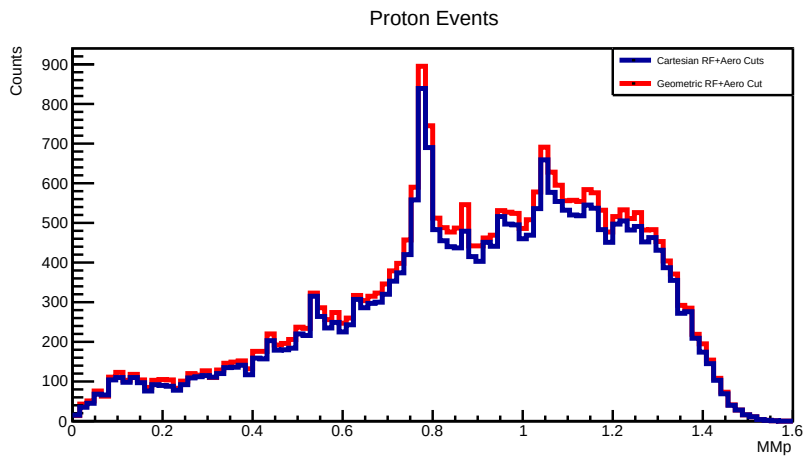


Geometric PID Cut (2)









Geometric PID Cut (3)