
EXTRACT SDMES FOR RH00

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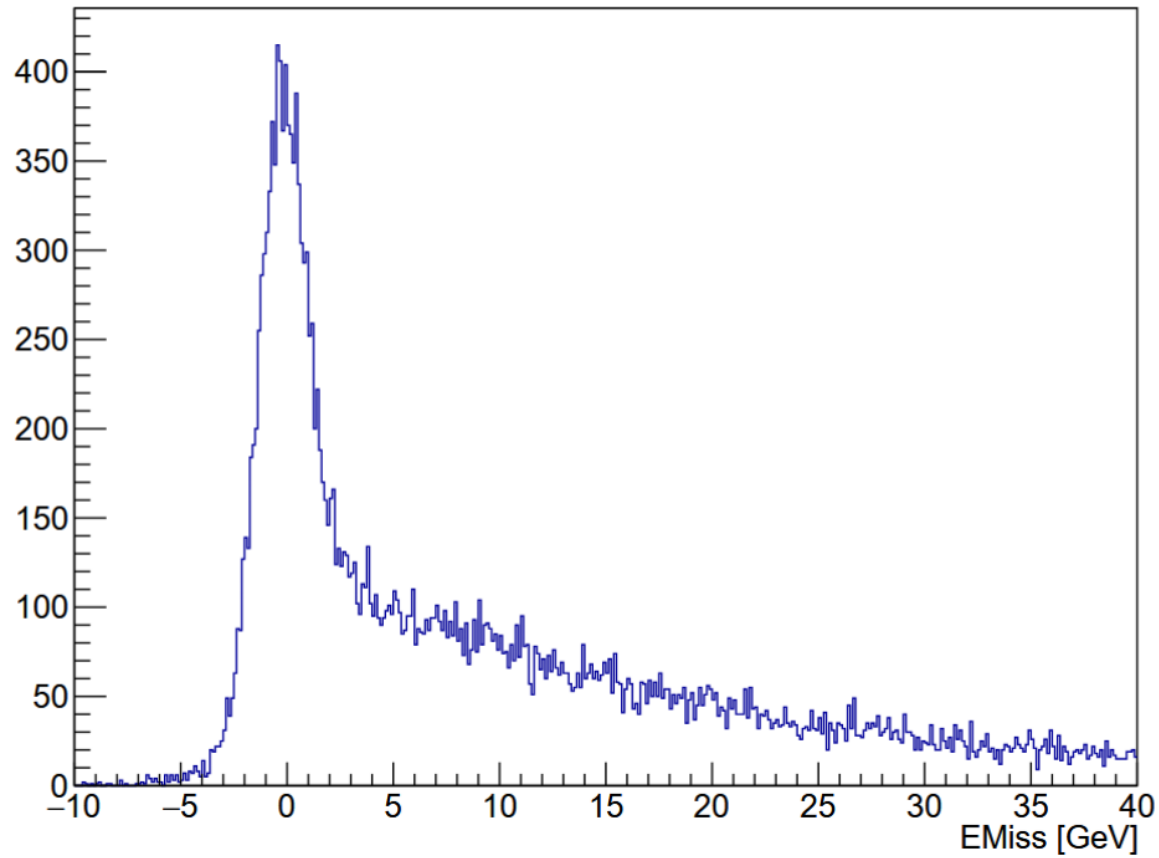
STEP BY STEP PROCESS

1. Create and match a Monte Carlo for the reaction
 - Using HepGen as the Generator and COMPASS detector simulation
 - Using MLM calculate SDME integrated over all kinematics (WITH BACKGROUND)
 2. Use a Monte Carlo to subtract the background
 - Lepto Generator is used
 - Find Fbkg
 - Reweight HepGen to match background subtracted data
 3. Use the MLM background subtraction to find SDMEs for the signal (23) and background (23)
 4. 3D binning in Q^2 , W and $-t$ since our SDME depends on them
 - Statistics might be lacking for full 3D binning, start with 1D for each
 - Use x_B instead of W since our cross-section has this dependence, greater kinematic coverage between jlab and compass
 - COMPASS used p_{t2} for 2012 data instead of $-t$: $|t| - t_0 \sim P_{t2}$
 5. Repeat step 4 for bins of Q^2 , x_B and $-t$ and Look at the different muon beams
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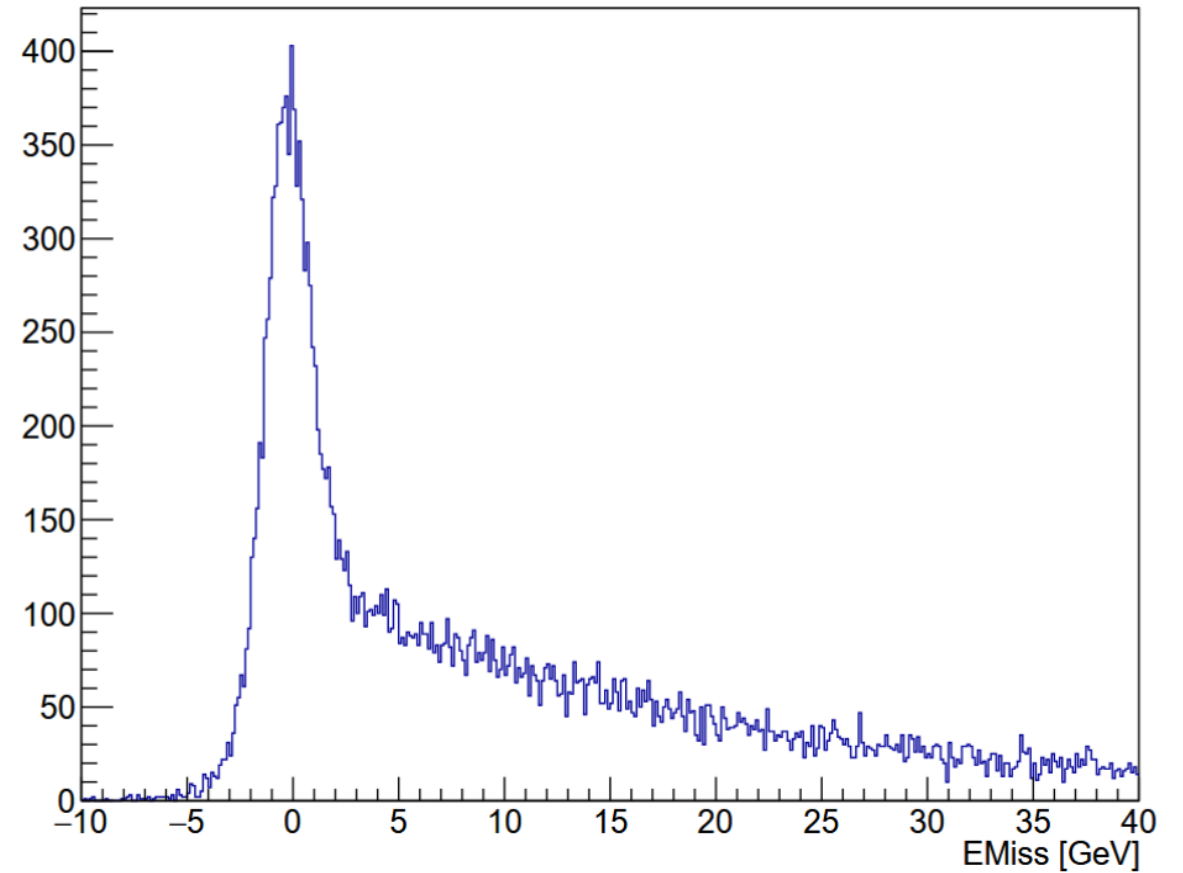
MU+ VS MU- BEAMS

EMiss per Muon beam

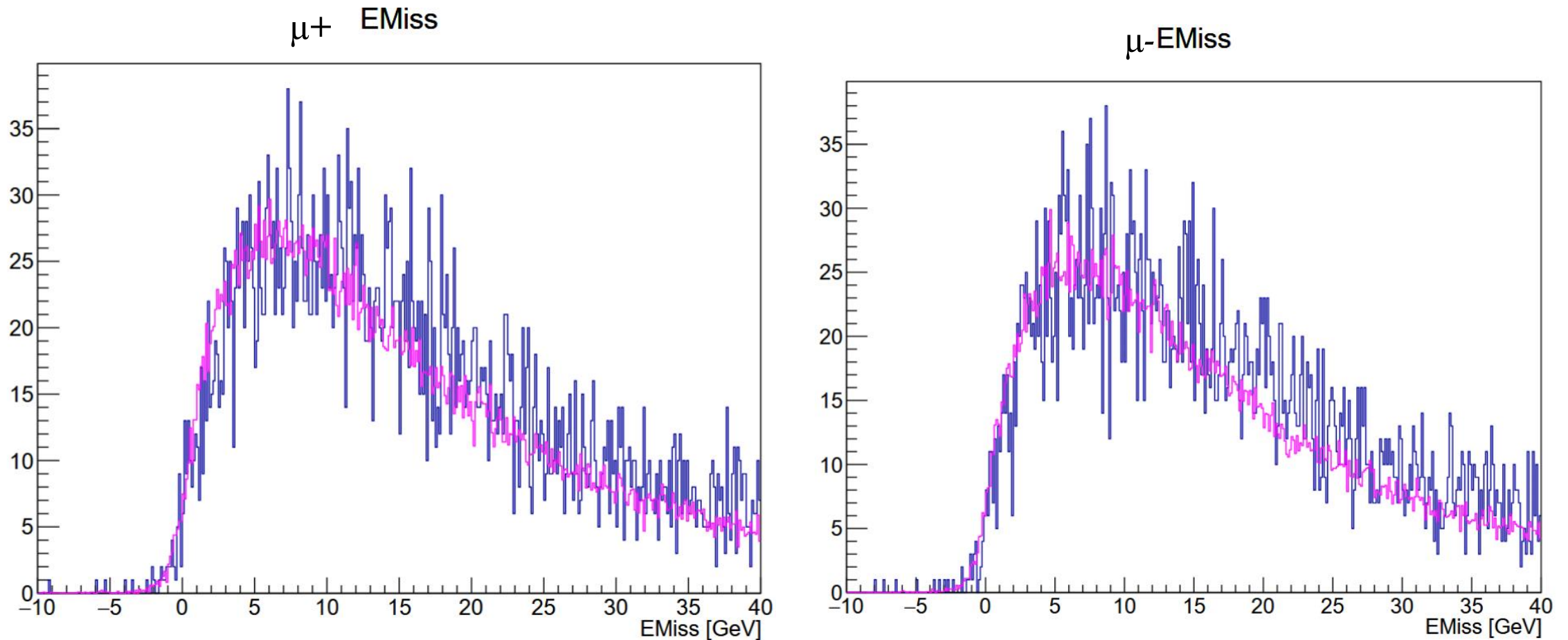
μ^+ EMiss



μ^- EMiss



EMiss per Muon beam Same Charge Hadron Events

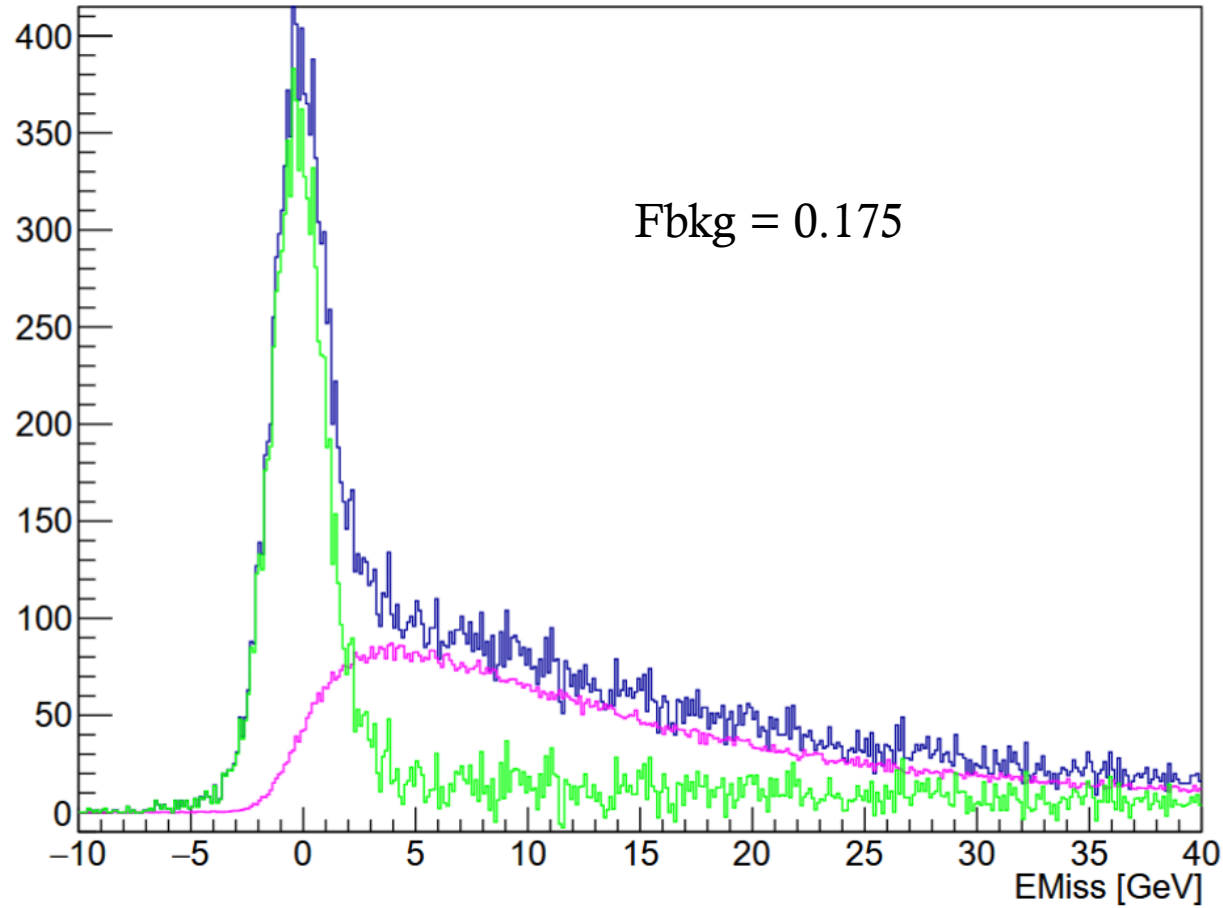


EMiss per Muon Beam Opposite Charge Hadron Events

Fbg is in the region
 $-2.5 < E_{\text{miss}} < 2.5$

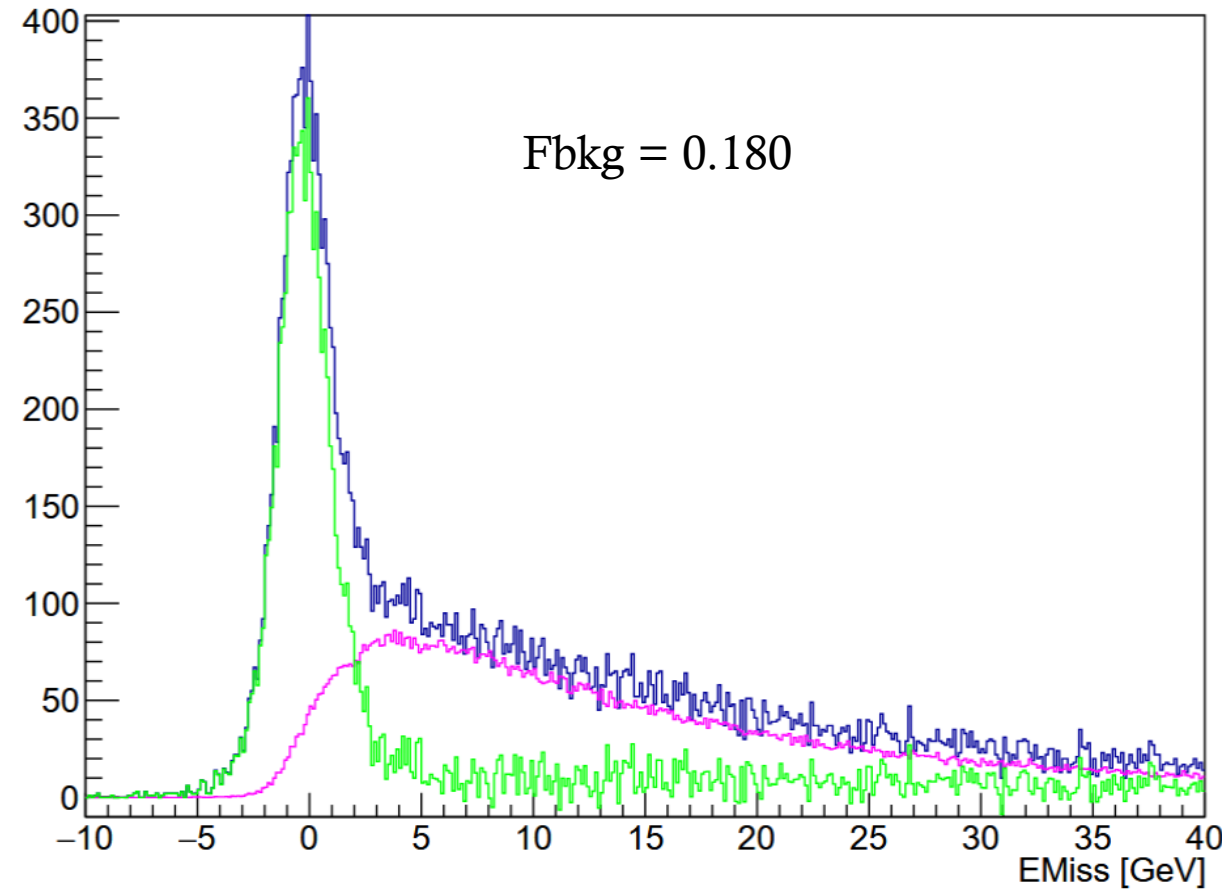
μ^+ EMiss

Fbkg = 0.175



μ^- EMiss

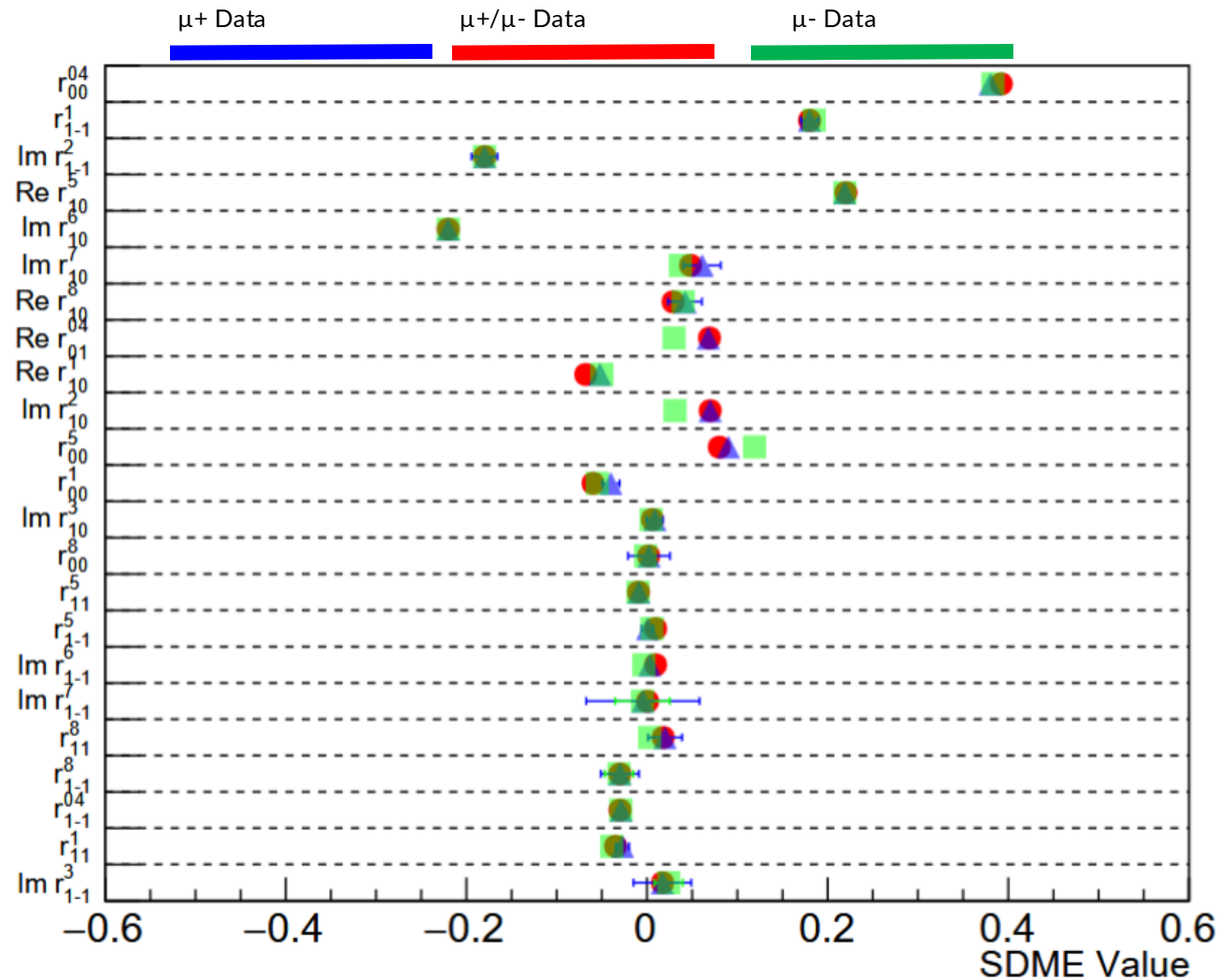
Fbkg = 0.180



Fractional Background and SDME for Muon Beam

Fbg is in the region
 $-2.5 < E_{\text{miss}} < 2.5$

μ^+	μ^-	$ \text{Diff}(\mu^+, \mu^-) $	Combined
0.175	0.180	0.005	0.198

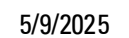


Background is
subtracted for
all three cases

Circled terms are the polarized ones



Circled terms are the polarized ones



CROSS CHECK

CROSS CHECK WITH BAKUR- RUN275515

		<input type="checkbox"/> Nick's Count	<input type="checkbox"/> Bakur's Count	<input type="checkbox"/> Nick/Bakur	<input type="checkbox"/>
1	Cut				
2	Total Events	14331	14331		1
3	Events with Primary Vertex	14331	14331		1
4	Tracks only have three outgoing particles	2023	2023		1
5	No. of events where beam has a track with parameters	2023	2023		1
6	No. of events where scattered muon passes Hodoscope check	1381	1381		1
7	No. of events where beam was first measured before the target	864	864		1
8	No. of events where first and last scattered muon z coord. are measured before and after SM1	863	863		1
9	No. of events where beam is detected by BMS	862	862		1
10	Beam and mu chi2 check	846	846		1
11	No. of events where radiation len of mu > 15	846	846		1
12	Penetration length of Hadron	676	676		1
13	Hadrons have good Quality of fit	656	656		1
14	The track of the hadron is before the first magnet	652	652		1
15	Hadrons have opposite charge	466	466		1
16	Missing Energy Cuts	330	330		1
17	In Target	277	277		1
18	Crossing Cells	270	270		1
19	Muons Energy are in range	270	270		1
20	Trigger	270	270		1
21	W Cut	230	230		1
22	Q2 Cut	186	186		1
23	Pt2 Cut	138	138		1
24	rho momentum cut	64	64		1
25	y cut	64	64		1
26	invariant mass cut	48	48		1
27	Time in Spill	38	38		1

CROSS CHECK WITH BAKUR- P09

Total P09 (h+/h-)	40704	40704	1
Q2 bin1	12444	12444	1
Q2 bin2	13600	13600	1
Q2 bin3	10319	10319	1
Q2 bin4	4341	4341	1
Total P09 (hh++--)	6454	6454	1
Q2 bin1	1937	1937	1
Q2 bin2	1857	1857	1
Q2 bin3	1171	1171	1
Q2 bin4	1171	1171	1

Event Selection Muons

Muon Beam:

- Using primary track
- Muon beam exist
- $-78.5 < Z \text{ vertex} < -318.5$
- 1 Hit in BMS
- probability of back propagation is bigger than 0.01
- Chi2 fit < 10
- Momentum and Momentum Error

Outgoing Muon:

- Track exist
- HodoHelper – Matches Muons
- Events are measured before and after SM1
- Chi2 fit < 10
- Radiation length > 15

Both:

- Muons have the same charge
- 3 outgoing particles

Both Pions:

- Both have tracks that exist
- Pions first (last) track is before (after) SM1
- Radiation length >10
- Chi2 fits < 10
- Pions have opposite charge

Event Selection MISC

- Wider Missing Energy Cut: -10 GeV to 20 GeV
- Muon beam is 140 to 180 GeV
- In target and Cross Cell (PaAlgo function)
- Scattered Muon energy is less than Muon beam
- total Z
- Triggers
- Bad Spills and time in spills
- Exclusive selection (The same as before)