COMPARISON OF RHO FOR CLAS12 AND COMPASS

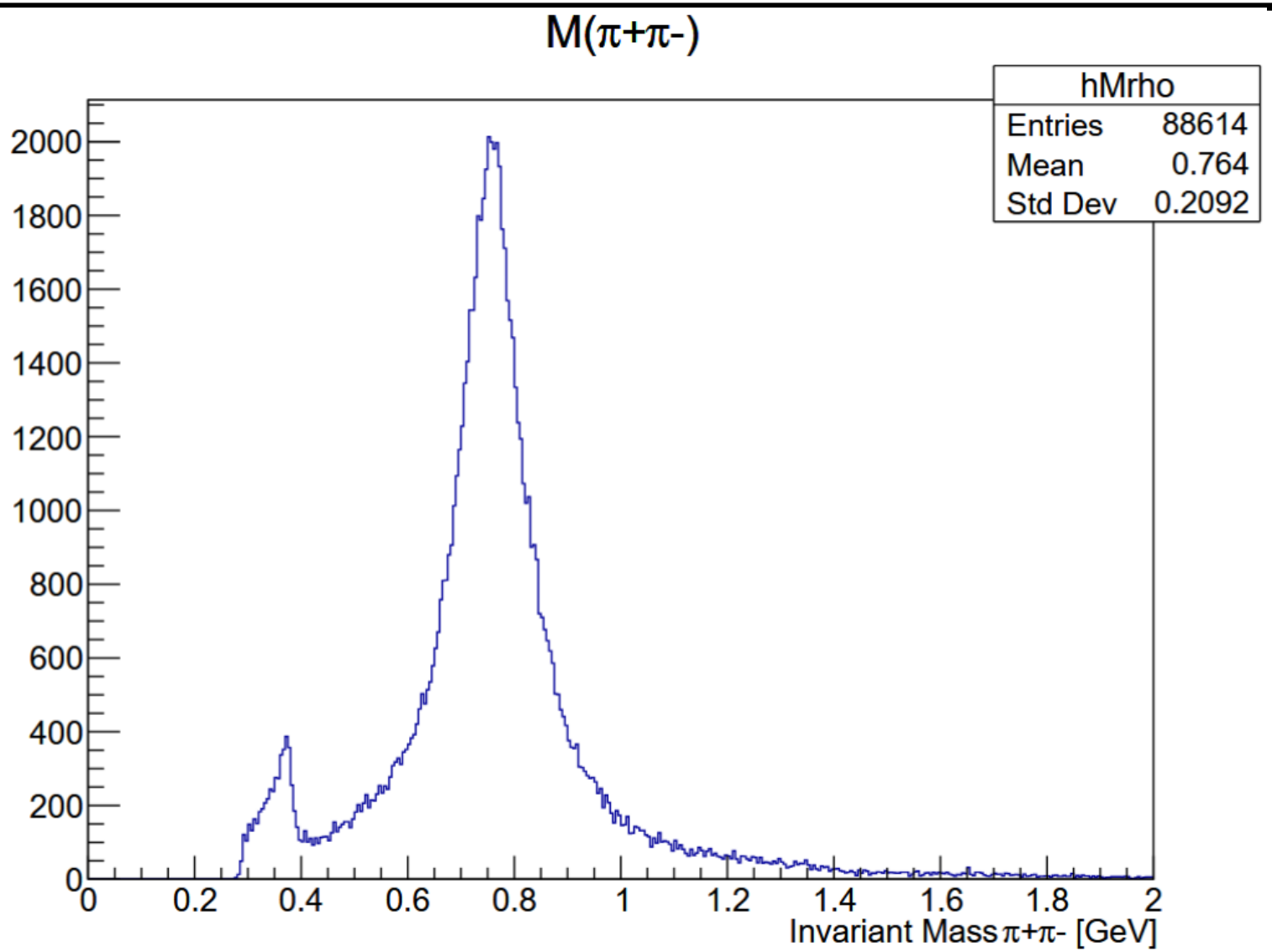
Nicholaus Trotta

DATA

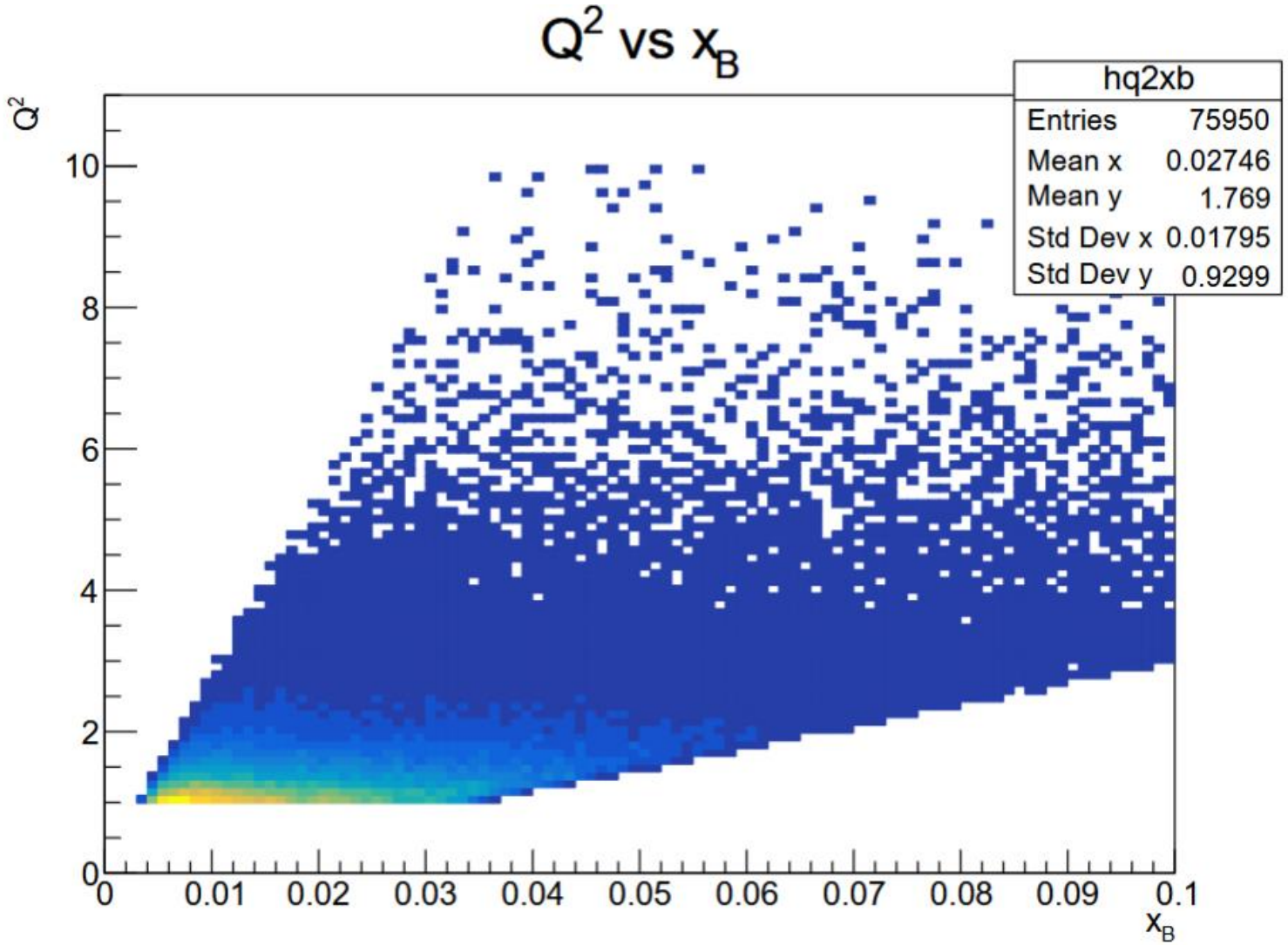
- Compass:
  - 2016 Period 4,5,6,7,8,9, slot 8
  - Channel : $\mu p \rightarrow \mu' \rho^0 X \rightarrow \mu' \pi^+ \pi^- X$
- CLAS12
  - Fall 2018 inbending dataset
  - Pass2, Forward and Central Detectors
  - Channel: $ep \rightarrow e' \rho^0 X \rightarrow e' \pi^+ \pi^- X$

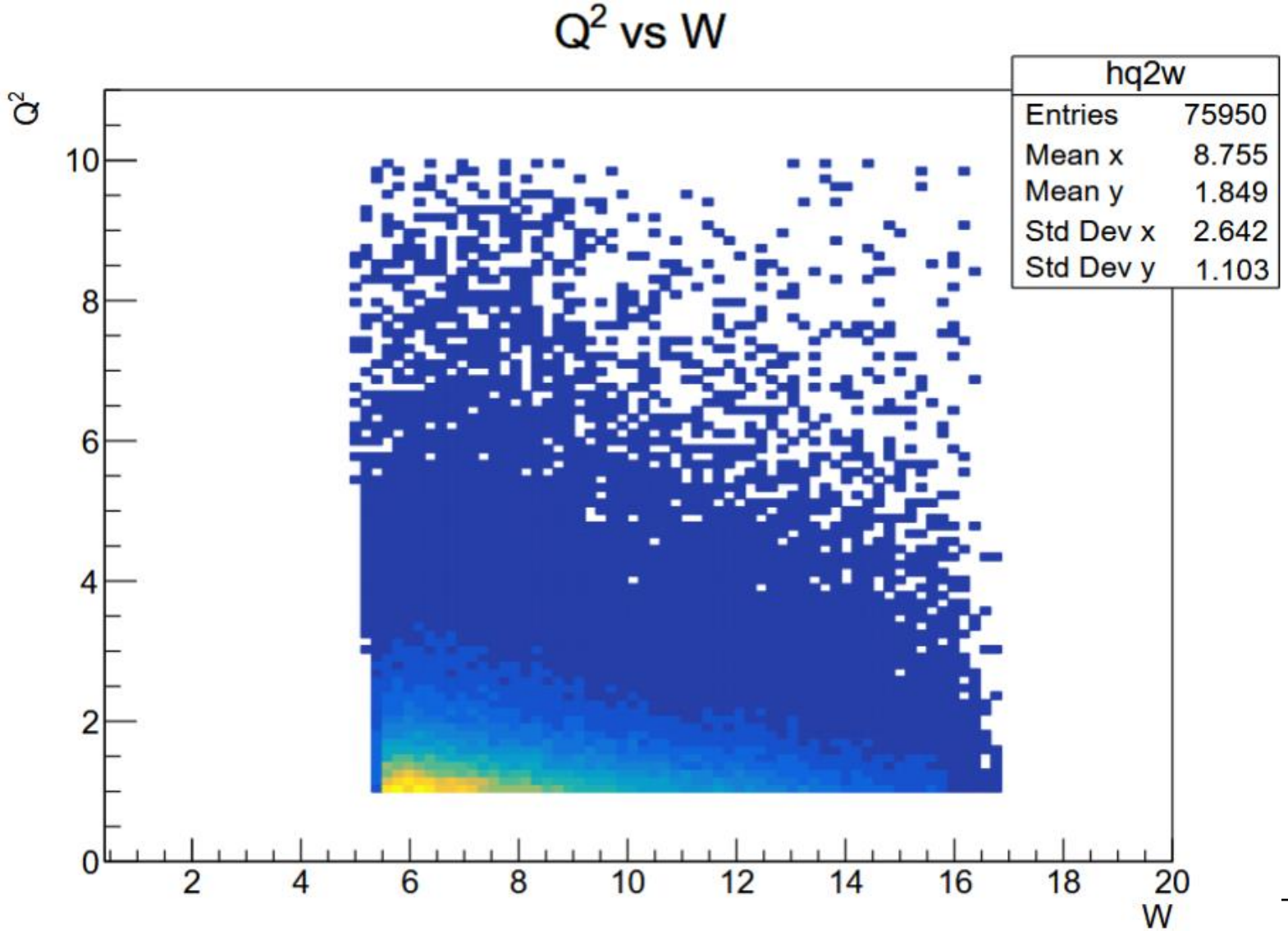
COMPASS EXCLUSIVE CUTS

- $W > 5$ GeV
- $0.1 < y < 0.9$
- $1.0 < Q^2 < 10$ GeV
- $\nu > 16$ GeV
- $0.01 < p^2_T < 0.5$ $(GeV/C)^2$
- $0.5 <$ Invariant Mass < 1.1 GeV/C^2
- $-2.5 < E_{Miss} < 2.5$ GeV
- Momentum of $\rho^0 > 15$ GeV/C



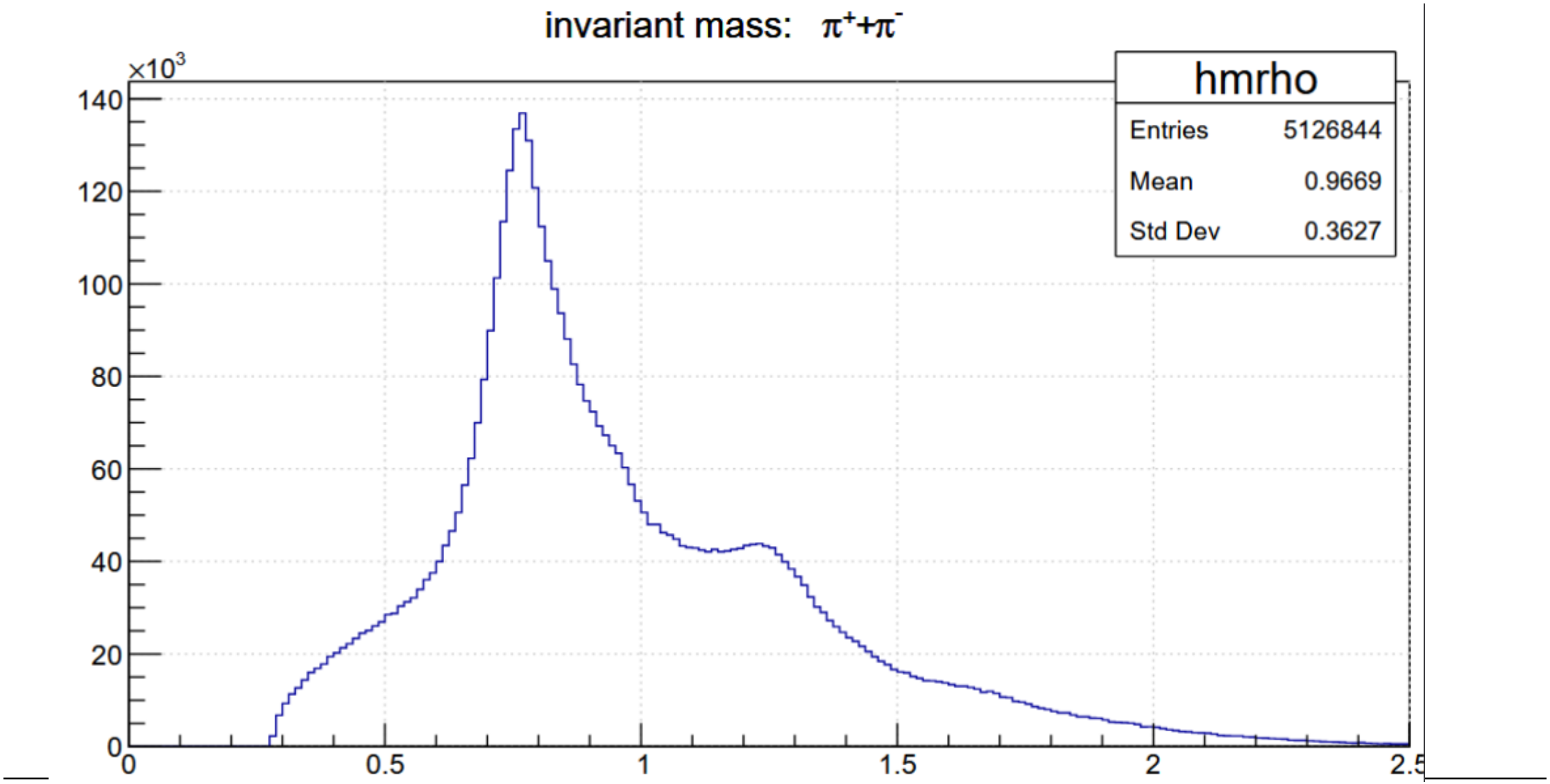
No Invariant Mass cut


Q^2 vs x_B
hq2xb
Entries 75950
Mean x 0.02746
Mean y 1.769
Std Dev x 0.01795
Std Dev y 0.9299
Q^2
0
2
4
6
8
10
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
x_B

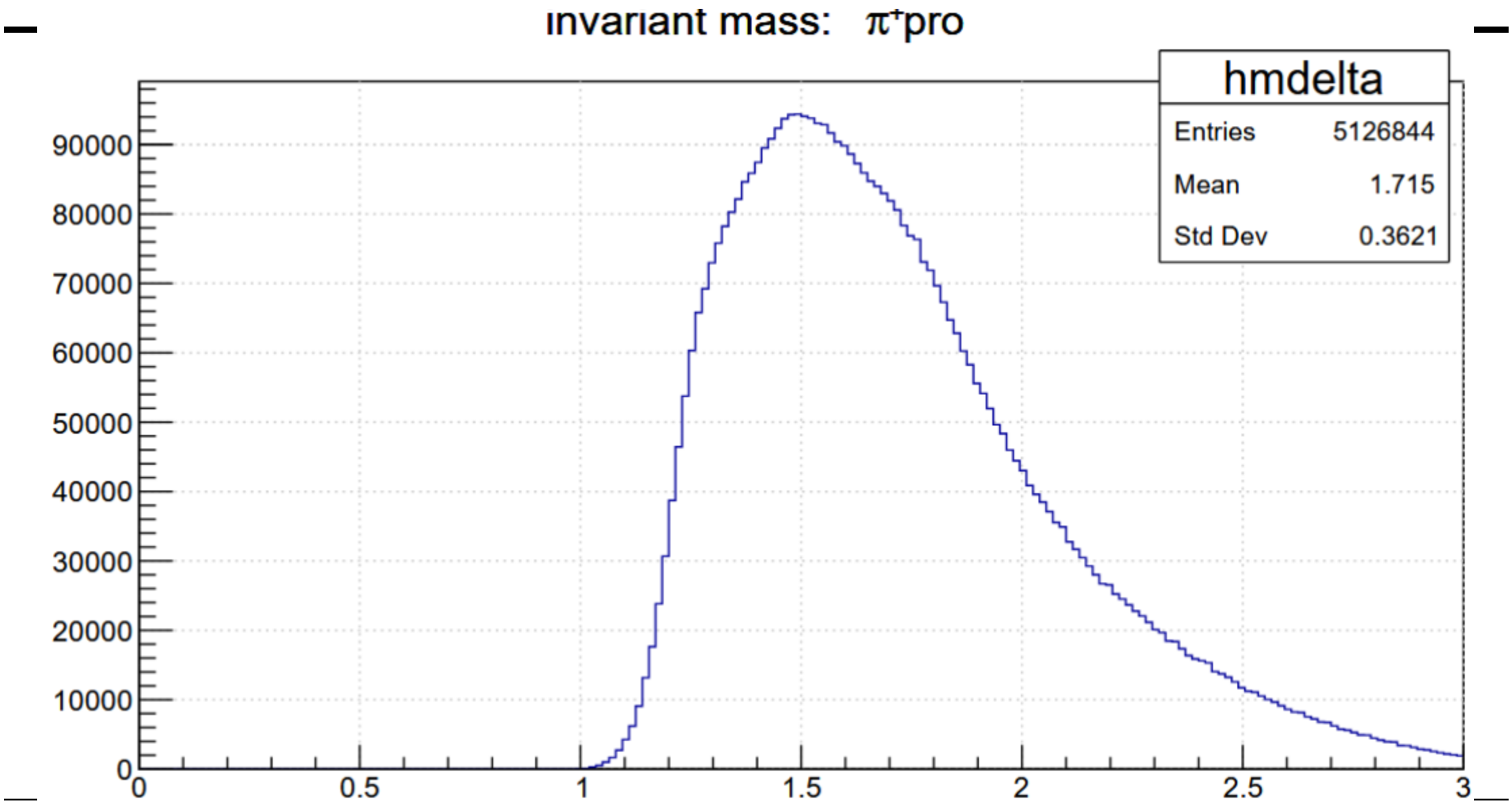

Q^2 vs W
hq2w
Entries 75950
Mean x 8.755
Mean y 1.849
Std Dev x 2.642
Std Dev y 1.103
Q^2
0
2
4
6
8
10
2
4
6
8
10
12
14
16
18
20
W

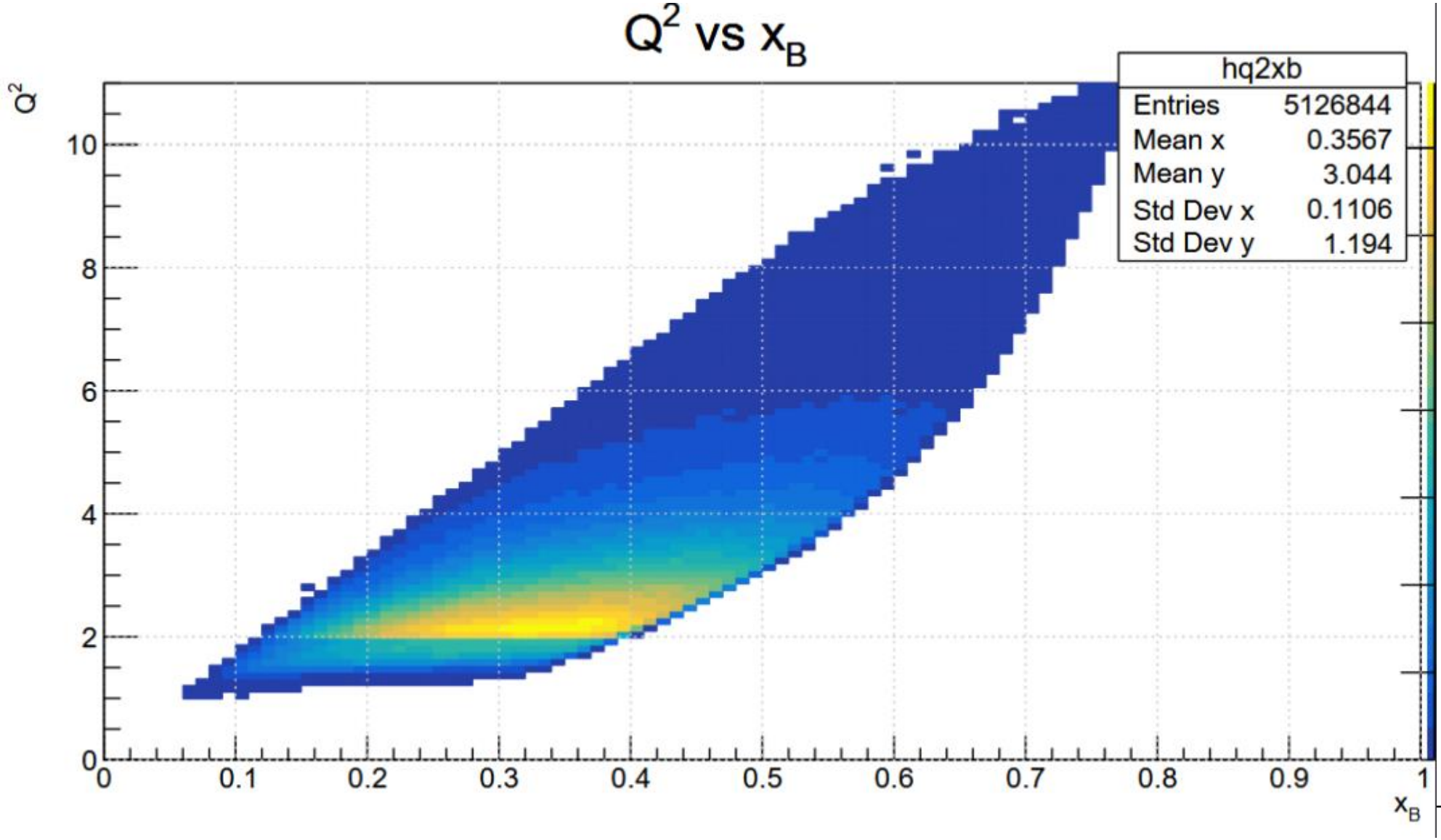
CLAS12 EXCLUSIVE CUTS (ONLY MISSING MASS)

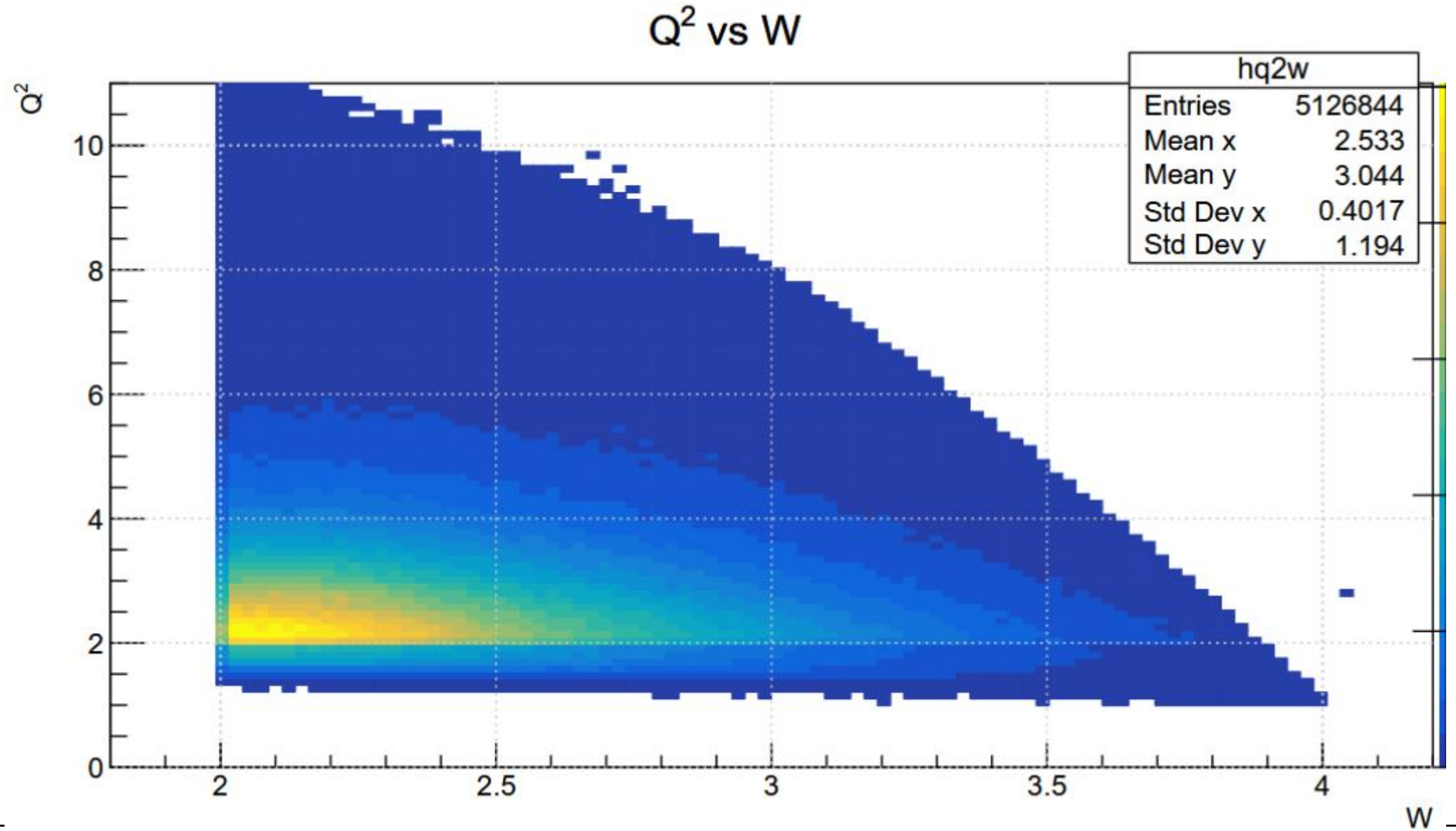
- $W > 2$ GeV
- $Q^2 > 1$ GeV
- $0.85 <$ Missing Mass < 1.05 GeV/C^2



No Invariant Mass cut

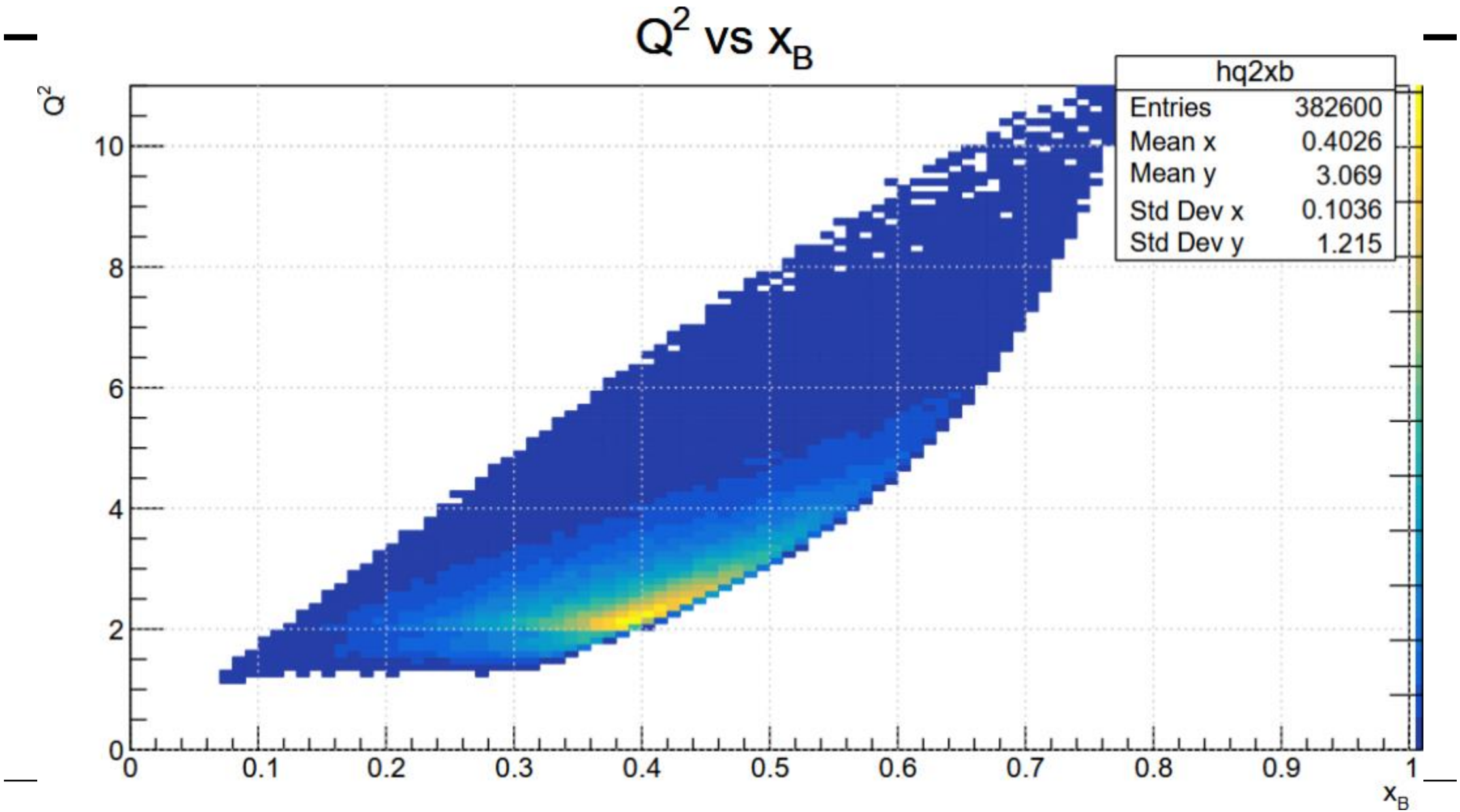

Invariant mass: π^+pro
hmdelta
Entries 5126844
Mean 1.715
Std Dev 0.3621
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
0.5
1
1.5
2
2.5
3

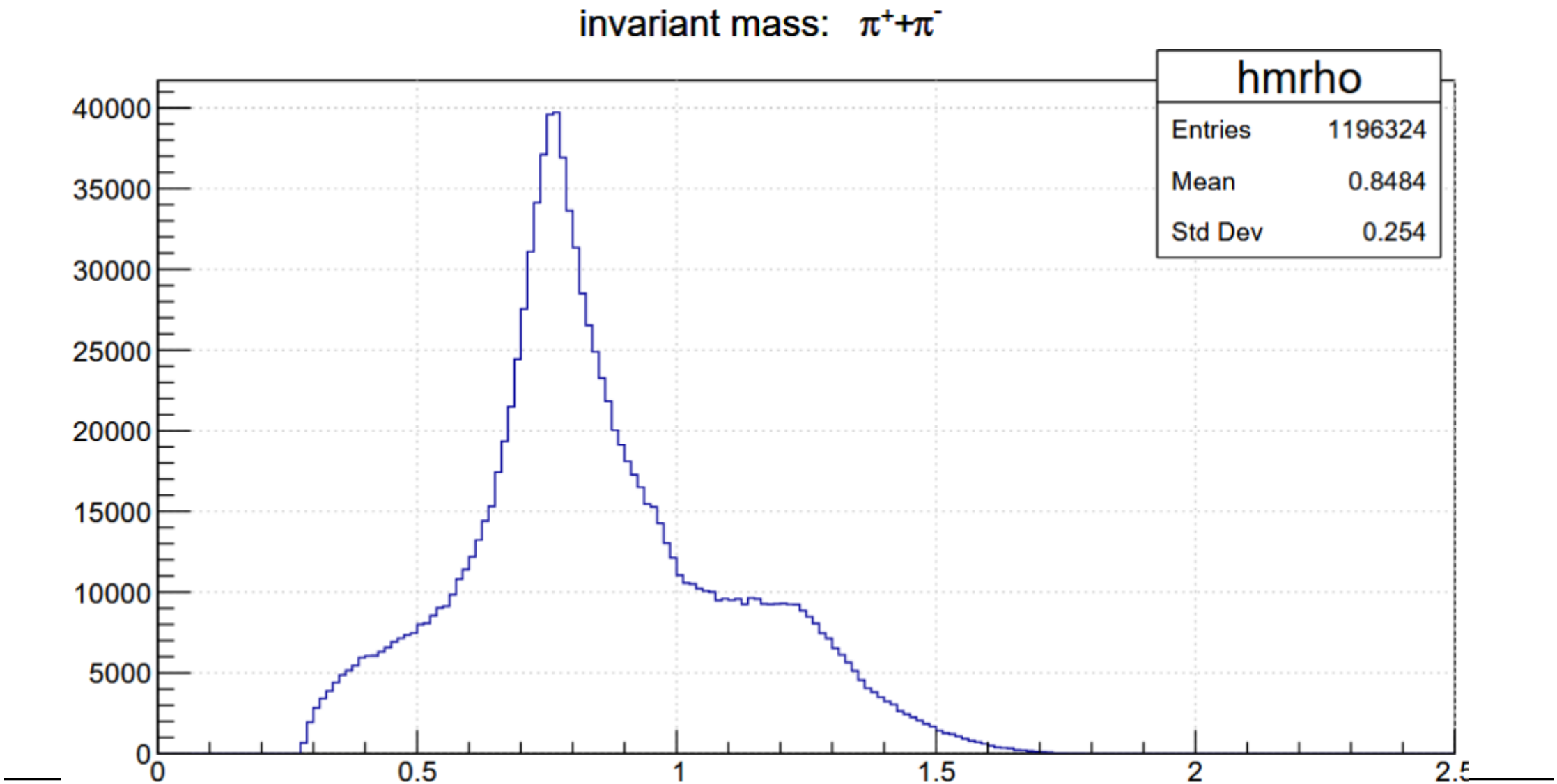

Q^2 vs x_B
hq2xb
Entries 5126844
Mean x 0.3567
Mean y 3.044
Std Dev x 0.1106
Std Dev y 1.194
Q^2
x_B
0
2
4
6
8
10
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Q² vs W
hq2w
Entries 5126844
Mean x 2.533
Mean y 3.044
Std Dev x 0.4017
Std Dev y 1.194
Q²
W
0
2
4
6
8
10
2
2.5
3
3.5
4

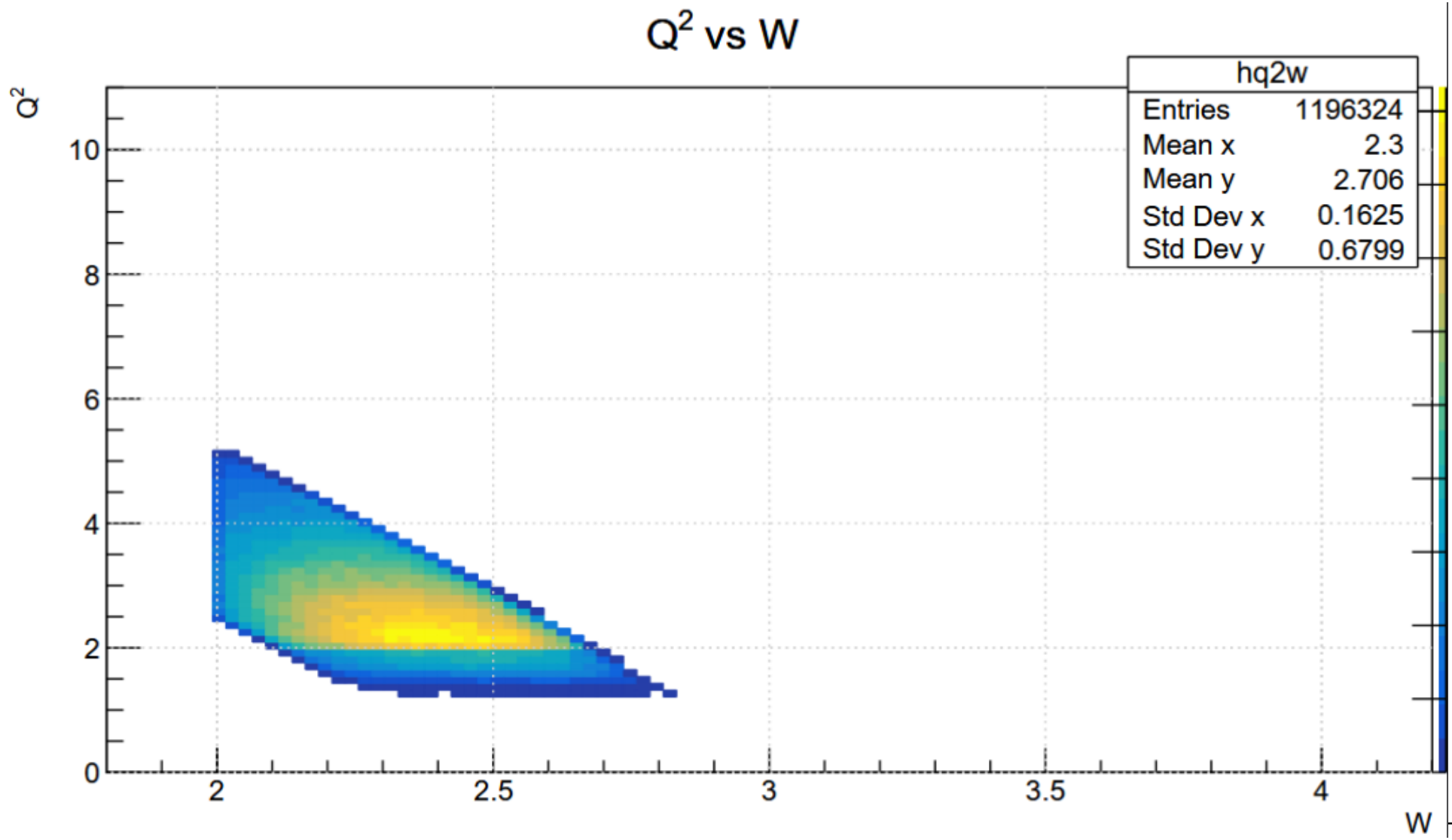
CLAS12 EXCLUSIVE CUTS (MATCH COMPASS)

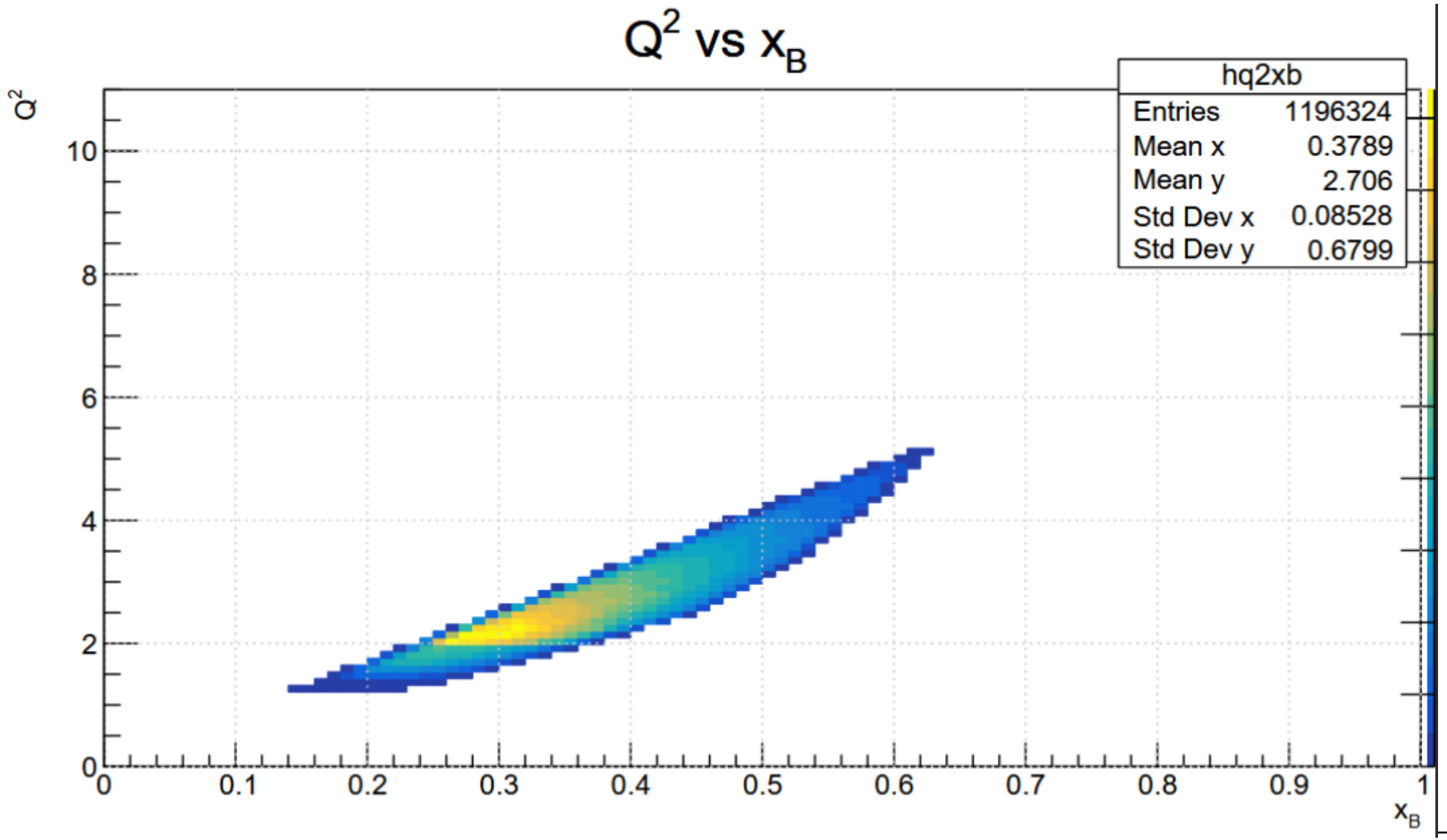
- $W > 2$ GeV
- $Q^2 > 1$ GeV
- $0.85 <$ Missing Mass < 1.05 GeV/C^2
- $0.5 <$ Invariant Mass < 1.1 GeV/C^2 d
- $3 < nu < 4.4$ GeV
- $2.5 <$ Momentum of $\rho^0 < 4$ GeV/C
- $0.01 < pt2 < 0.5$ $(GeV/C)^2$


Q^2 vs x_B
hq2xb
Entries 382600
Mean x 0.4026
Mean y 3.069
Std Dev x 0.1036
Std Dev y 1.215
Q^2
x_B
0
2
4
6
8
10
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1



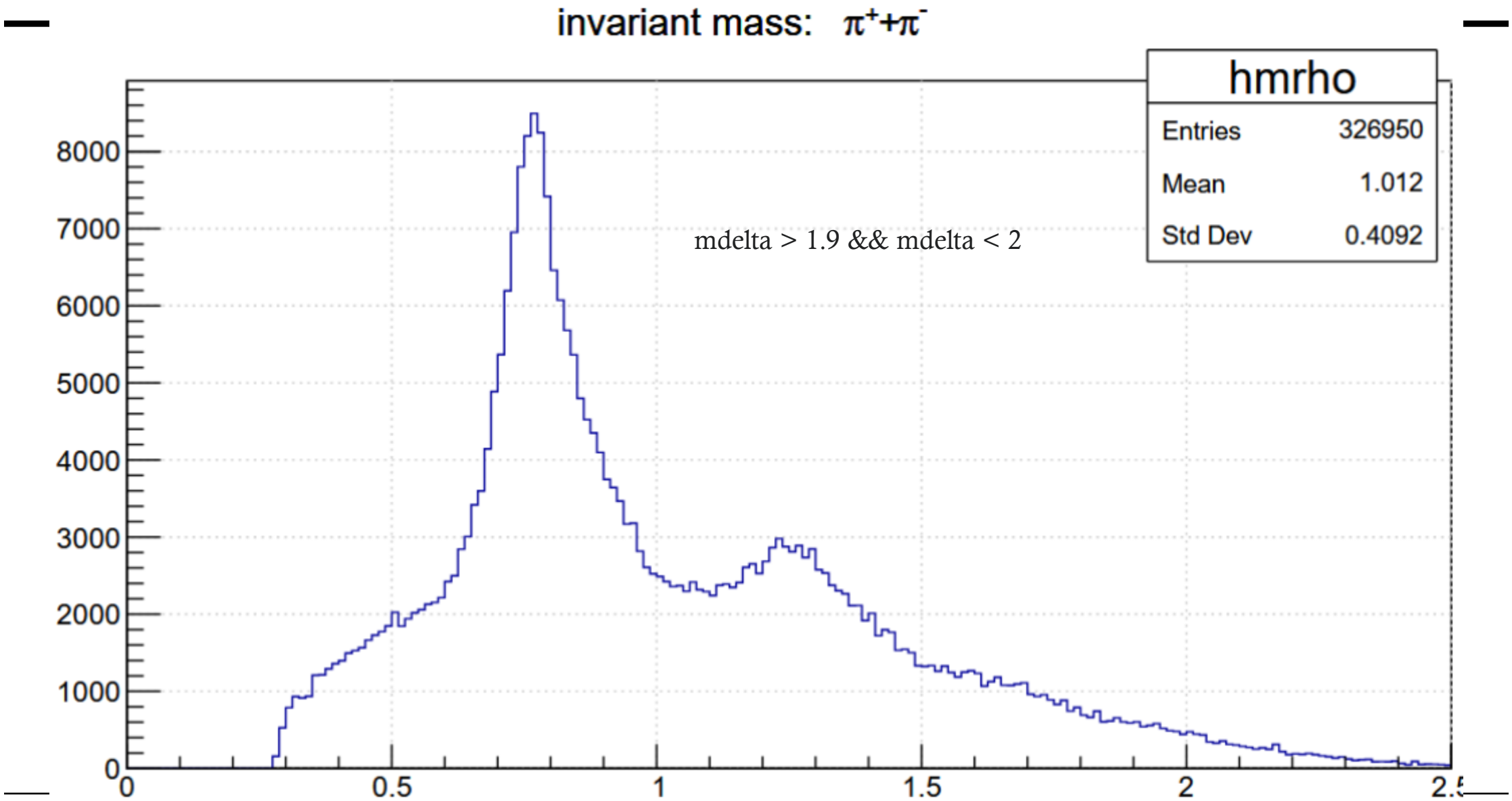
No Invariant Mass cut

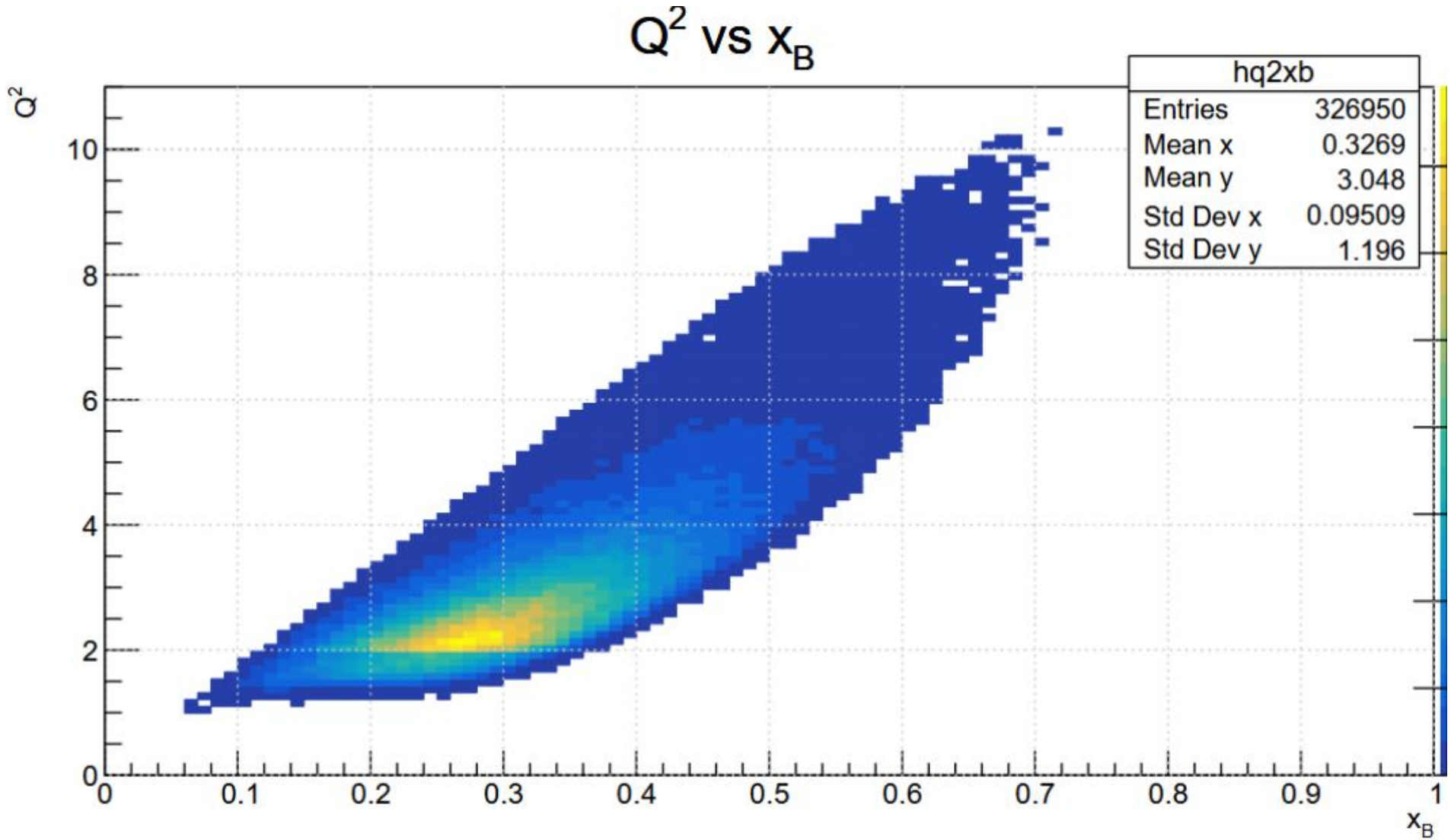

Q^2 vs W
hq2w
Entries 1196324
Mean x 2.3
Mean y 2.706
Std Dev x 0.1625
Std Dev y 0.6799
Q^2
10
8
6
4
2
0
2
2.5
3
3.5
4
W

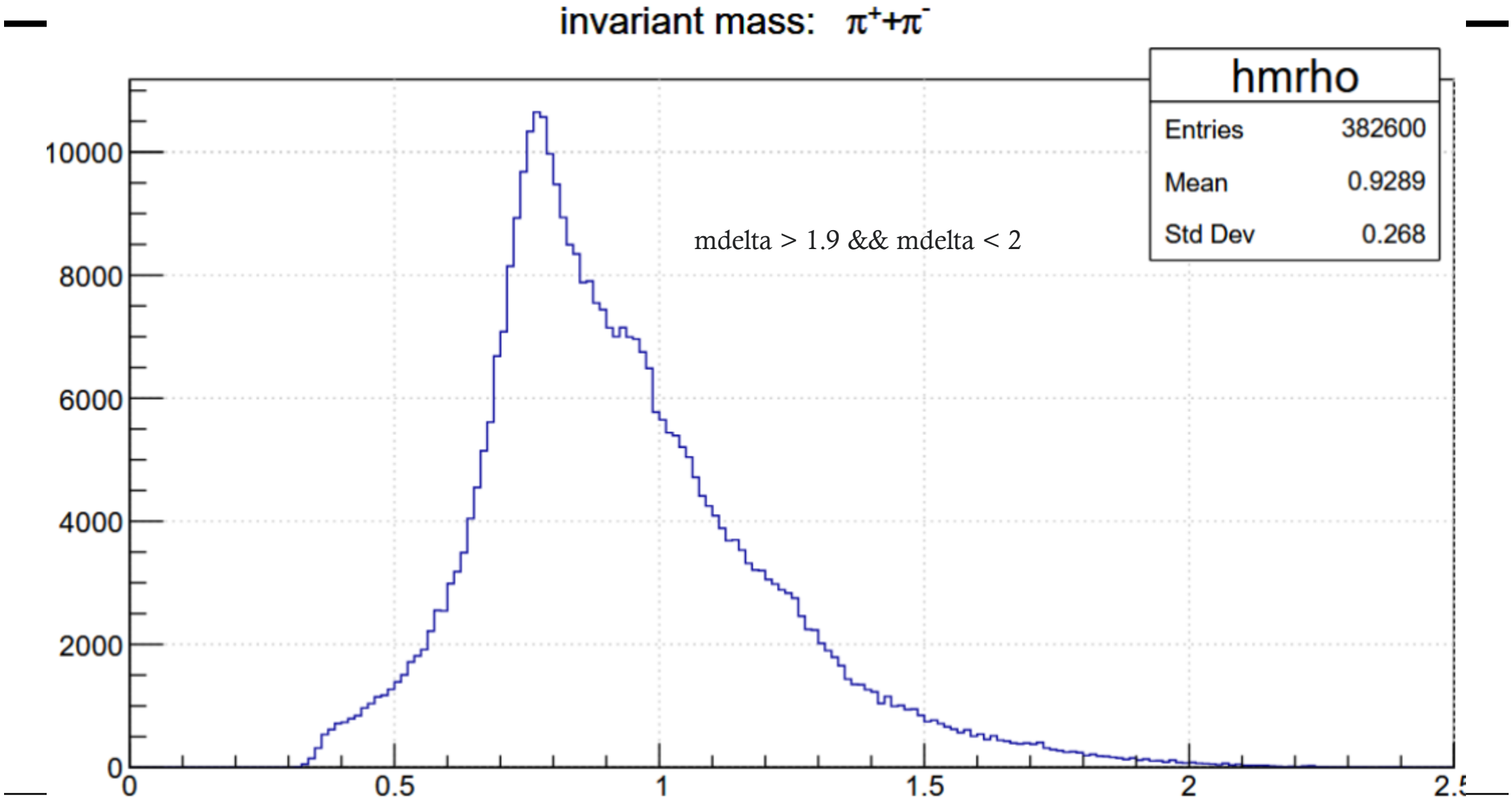

Q^2 vs x_B
hq2xb
Entries 1196324
Mean x 0.3789
Mean y 2.706
Std Dev x 0.08528
Std Dev y 0.6799
Q^2
0
2
4
6
8
10
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
x_B

CLAS12 EXCLUSIVE CUTS (REMOVING DELTA EVENTS)

- W > 2 GeV
- Q^2 > 1 GeV
- 0.85 < Missing Mass < 1.05 GeV/C^2
- Two different delta++ cuts:
  - mdelta > 1.9 && mdelta < 2
  - mdelta > 1.2 && mdelta < 1.3


invariant mass: π⁺+π⁻
hmrho
Entries 326950
Mean 1.012
Std Dev 0.4092
mdelta > 1.9 && mdelta < 2
8000
7000
6000
5000
4000
3000
2000
1000
0
0
0.5
1
1.5
2


Q^2 vs x_B
hq2xb
Entries 326950
Mean x 0.3269
Mean y 3.048
Std Dev x 0.09509
Std Dev y 1.196
Q^2
x_B
0
2
4
6
8
10
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


invariant mass: π+π-
hmrho
Entries 382600
Mean 0.9289
Std Dev 0.268
mdelta > 1.9 && mdelta < 2
10000
8000
6000
4000
2000
0
0
0.5
1
1.5
2