Upsilon v2 status

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Condition

- Dataset:
  - HiOniaDoubleMu0
  - HiOniaDoubleMu0B
  - HiOniaDoubleMu0C
  - HiOniaDoubleMu0D
- Acceptance range: muon p_T > 4

- 1S binning

|y|: {0, 1.2, 2.4}

Centrality: {20, 30, 50, 80, 120}

p_T: {0, 3, 6, 10, 30}

dϕ: {0, π/8, π/4, 3π/8, π/2}

- 2S binning

|y|: {0, 1.2, 2.4}

Centrality: {20, 50, 120}

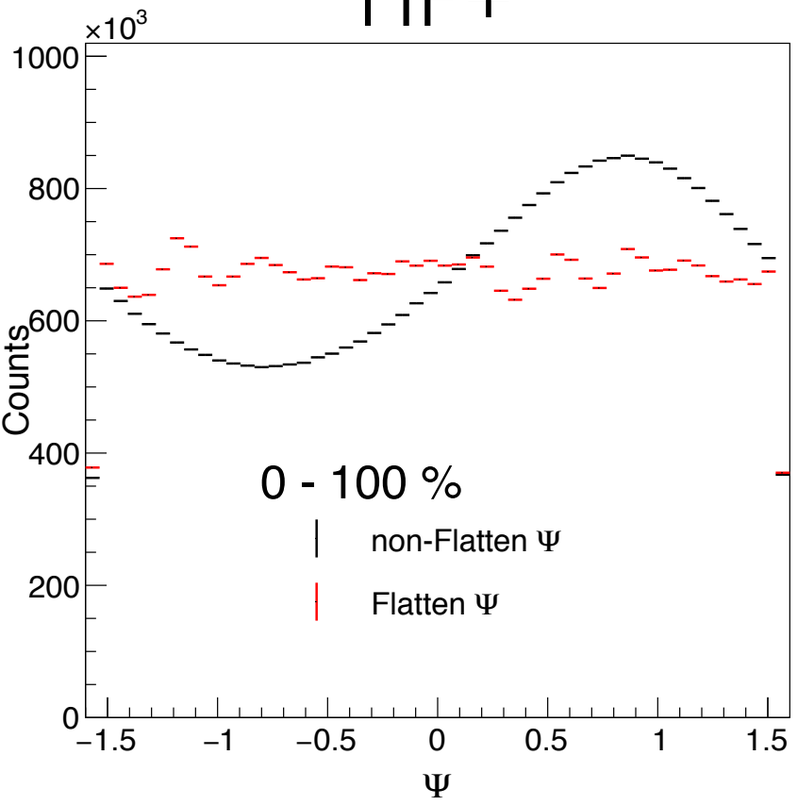
p_T: {0, 6, 30}

dϕ: {0, π/8, π/4, 3π/8, π/2}

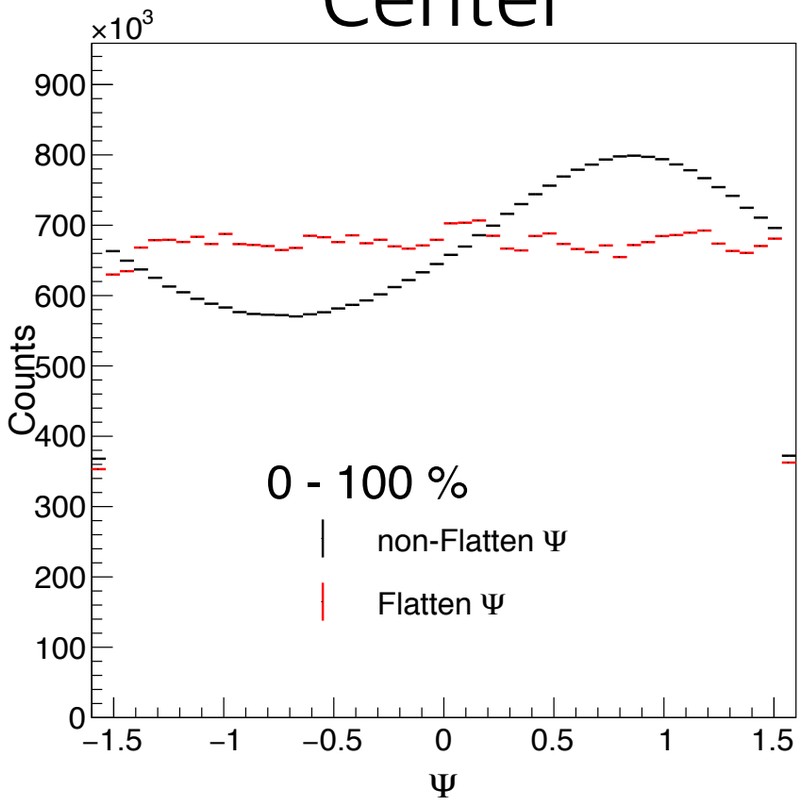
EventPlane Flattening

$$\Psi_2 = \Psi'_2\left(1 + \sum_j^{j_{max}} \frac{1}{j}\left(-\langle sin(2j\Psi'_2)\rangle cos(2j\Psi'_2) + \langle cos(2j\Psi'_2)\rangle sin(2j\Psi'_2)\right)\right)$$

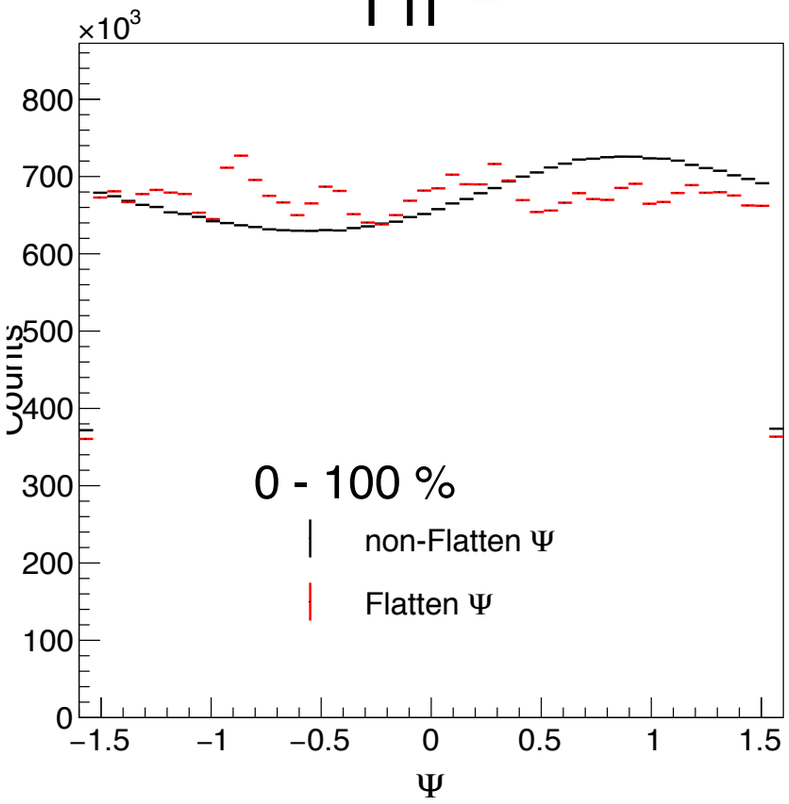
HF+



Center

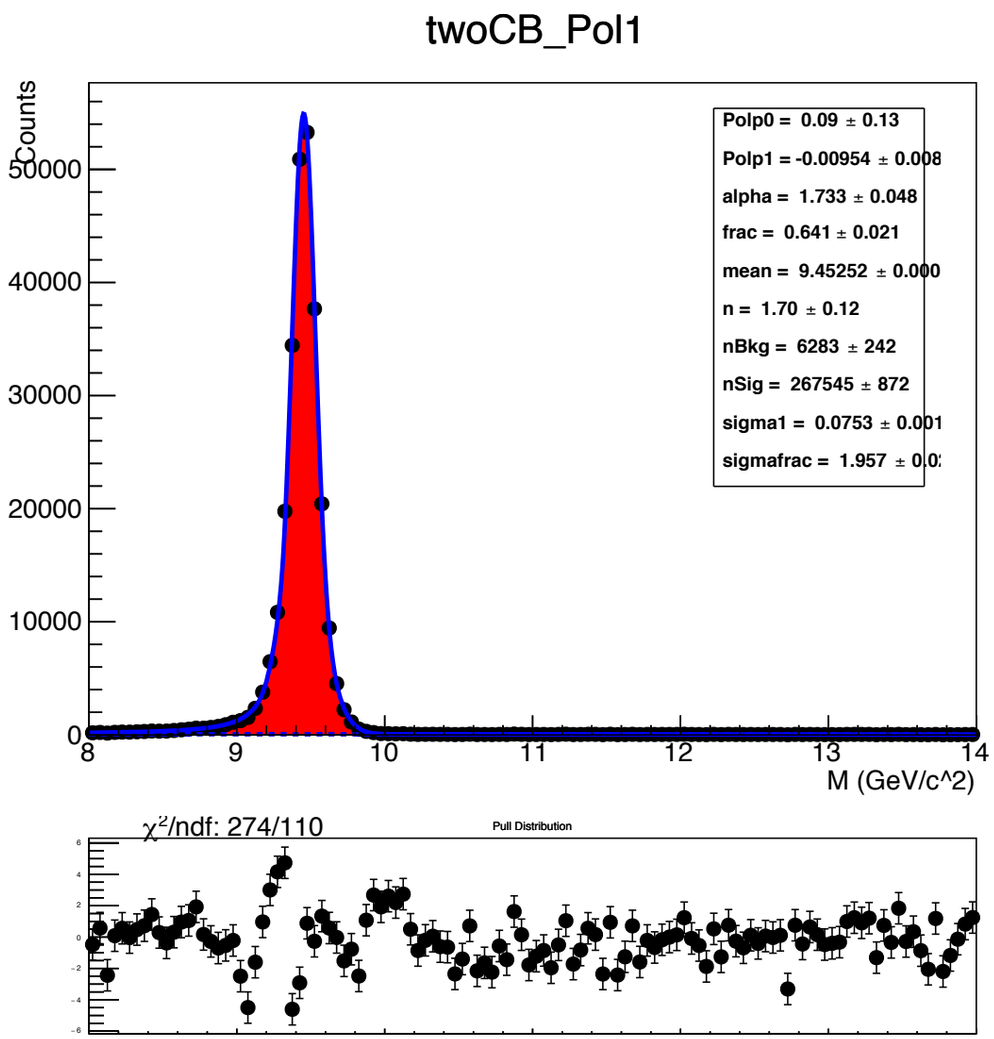


HF-



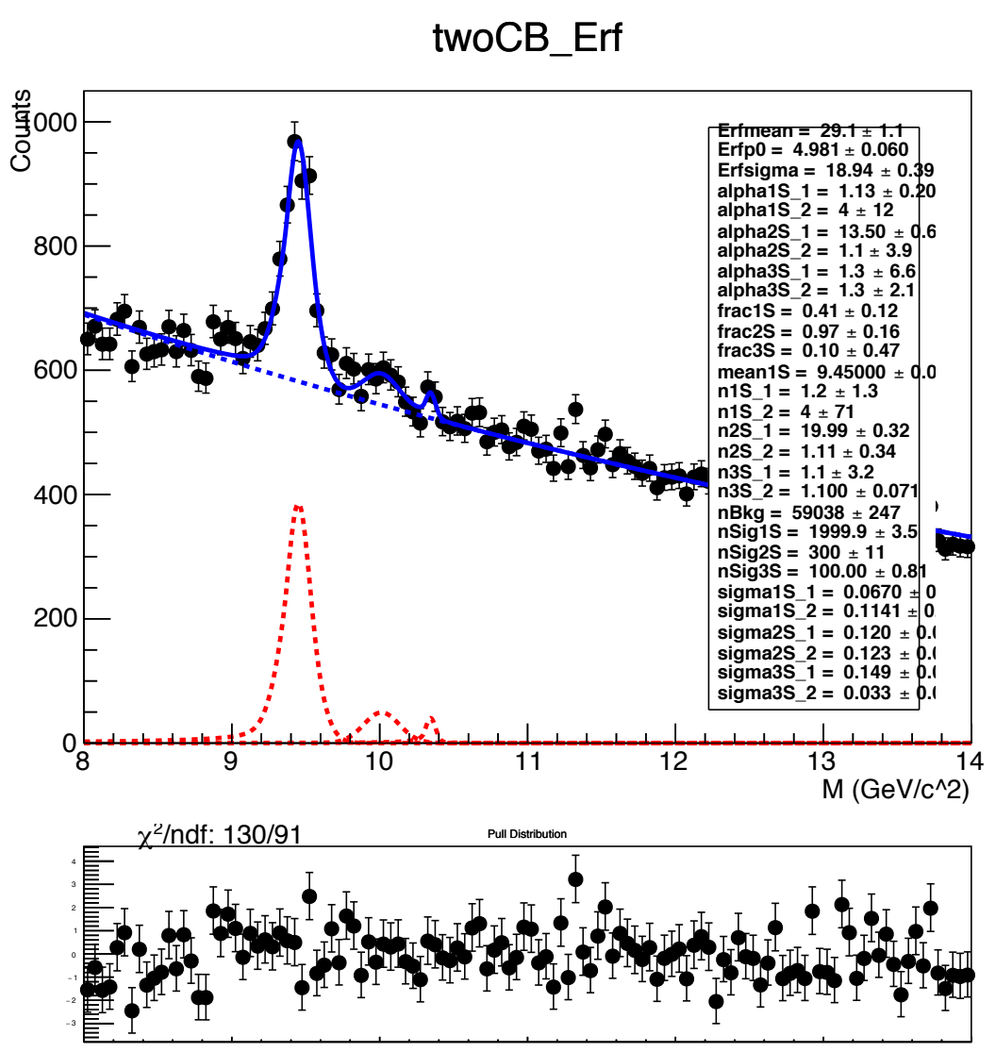
- Flattening is done with 9th order correction
- Amplitude between rpAng[6] and rpAng[7] and rpAng[8] are different

Signal function



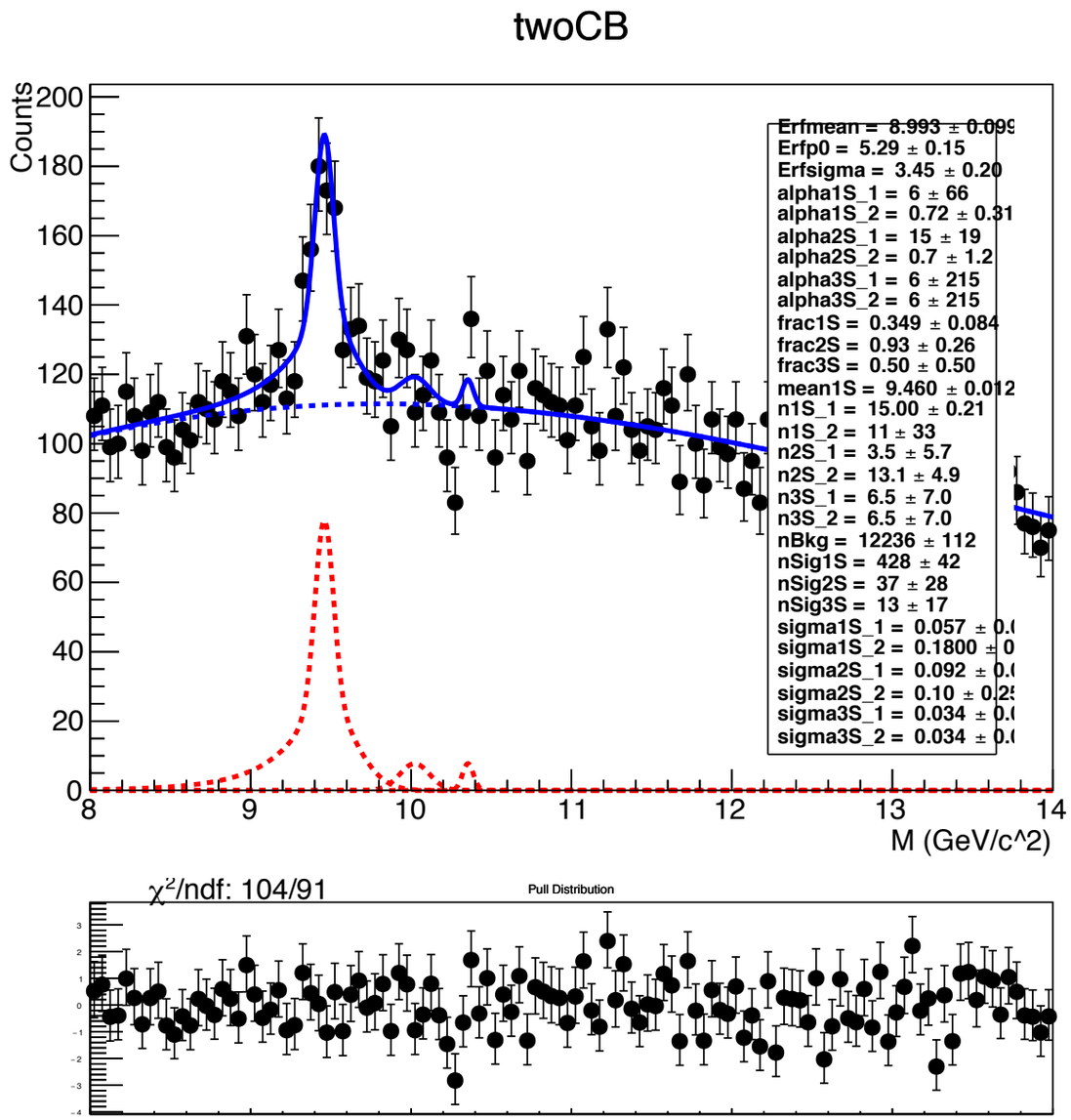
normalized χ^2	Gaus	twoGaus	CBGaus	CB	twoCB
1S	58.0	26.0	14.4	14.6	**2.5**
2S	44.1	32.7	8.5	10.1	**2.7**
3S	54.2	45.1	10.5	10.6	**2.3**

Background function



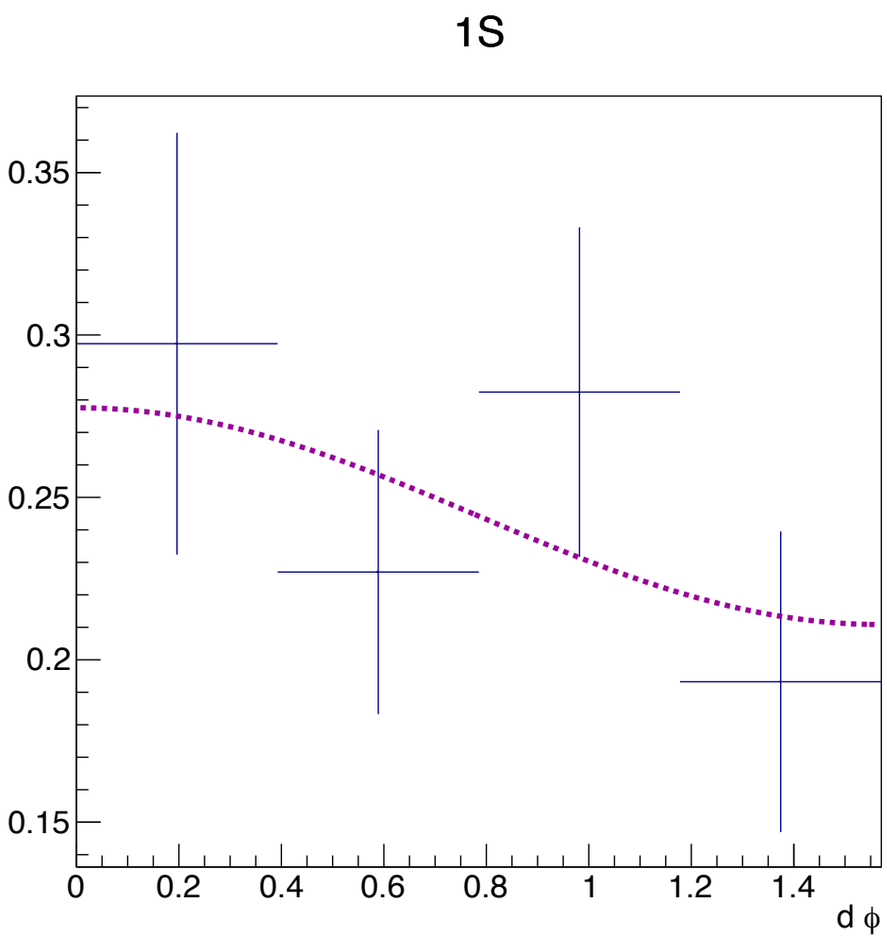
Function	Cheb1	Cheb2	Exp	Pol1	Erf
normalized χ^2	2.32	2.08	fail	4.96	**1.43**

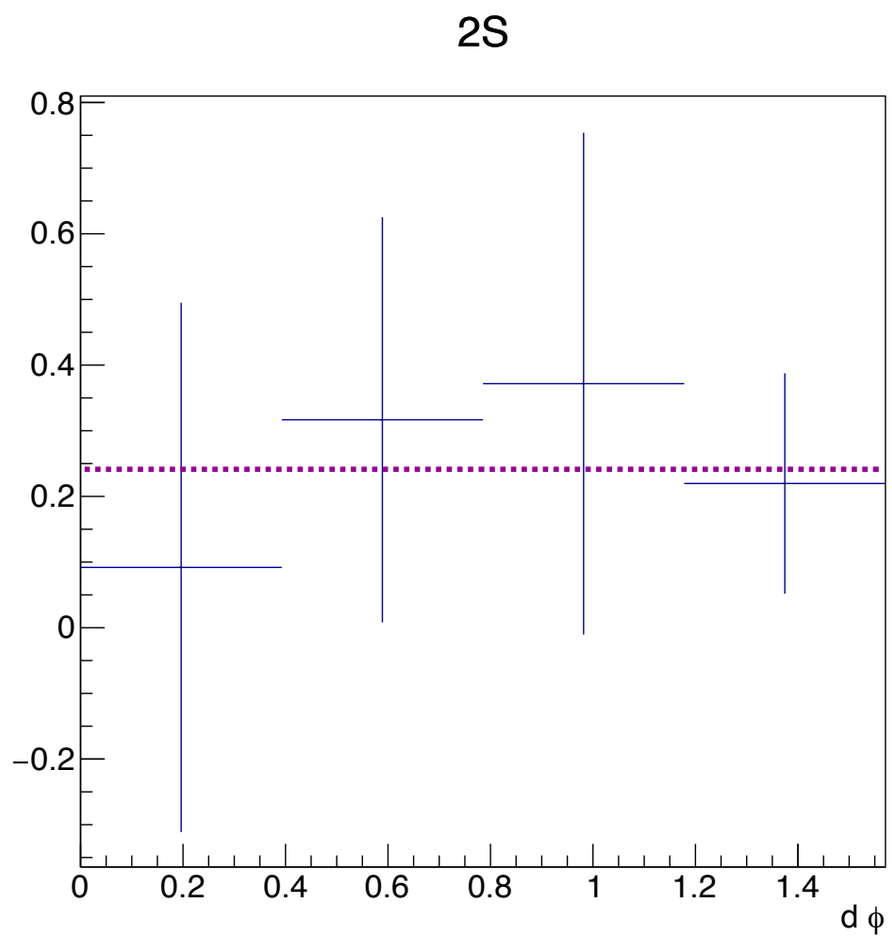
Mass Fit($0 \leq |y| < 1.2$, $0 \leq d\phi < \pi/6$)



- Mass fitting looks reasonable but need to check other bins

dN/d ϕ

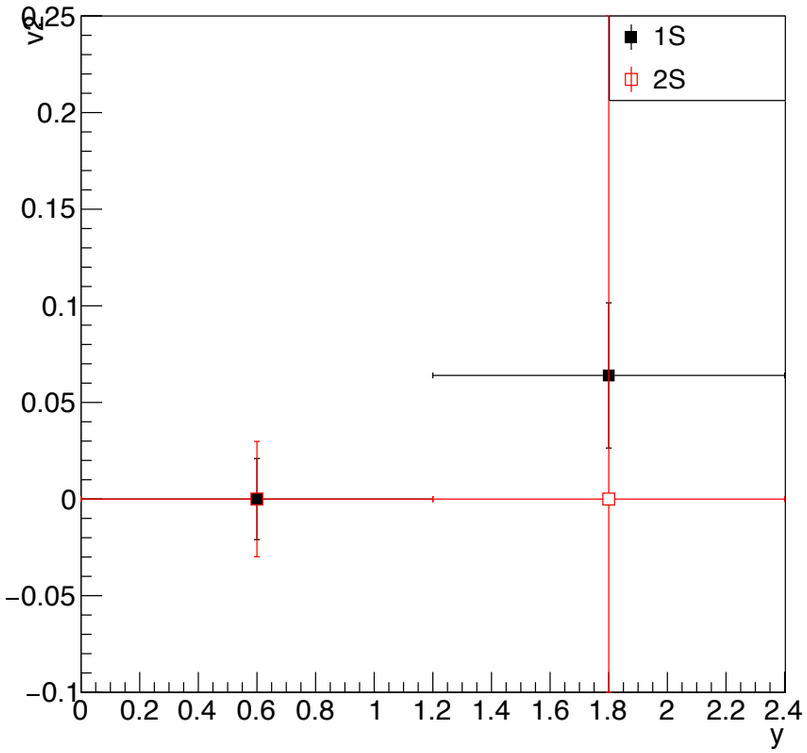




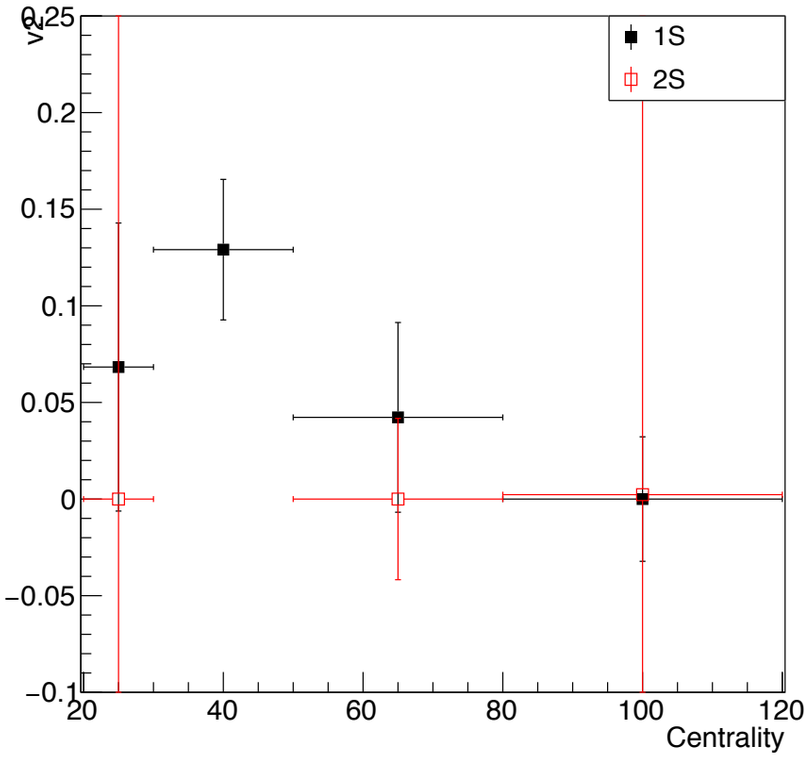
- Error bar is large with 4 centrality bin and 4 dϕ bin

V2

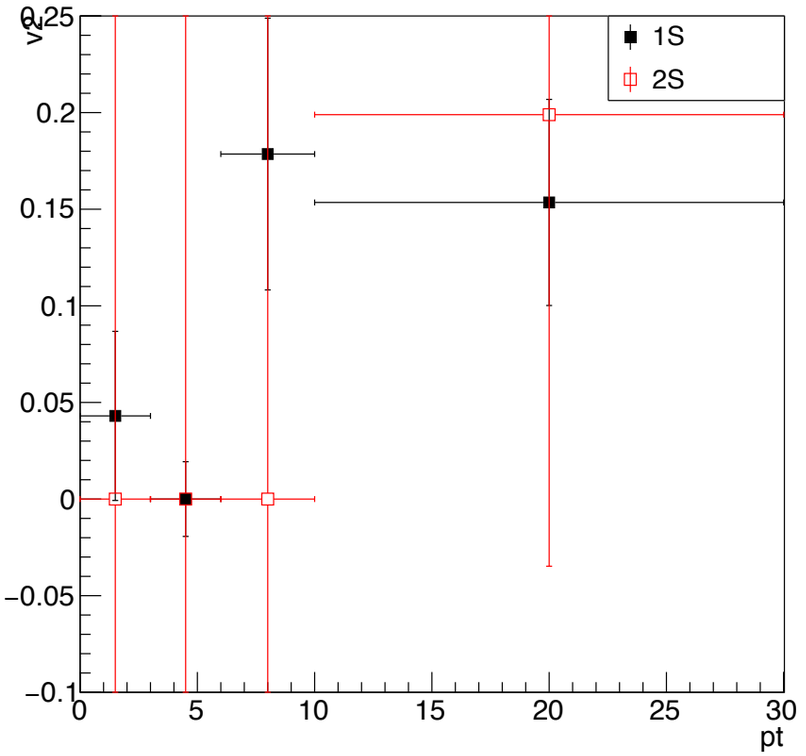
y



Centrality



p_T



- 2S is not reasonable
- 1S shows Centrality dependence
- p_T distribution is not reasonable

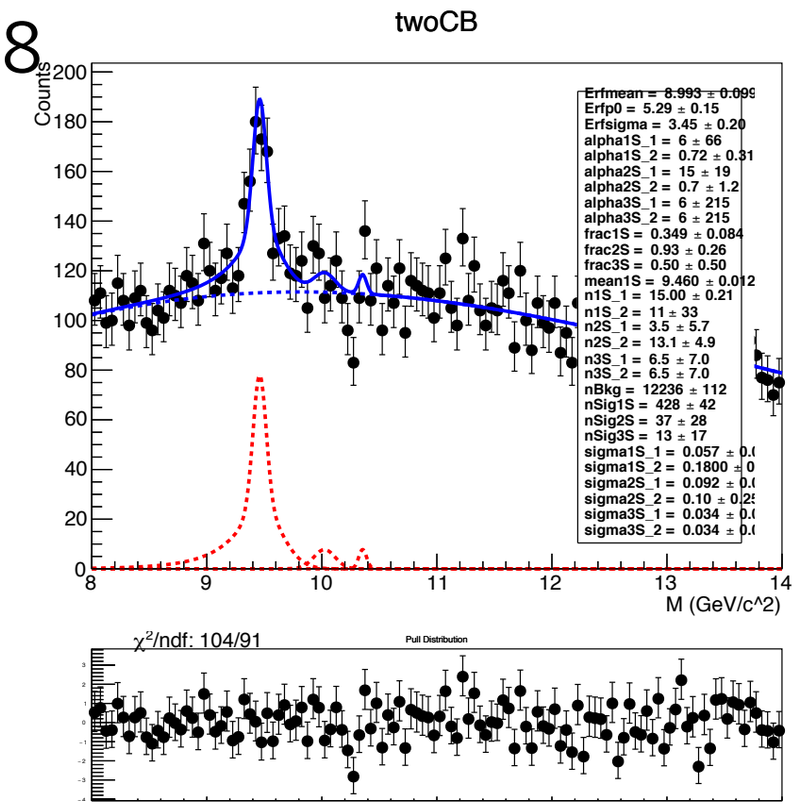
Summary

- 1. Rapidity
  - Need to refit mass distribution
  - Do we need rebinning?
- 2. Centrality
  - 1S v2 distribution is reasonable but last dN/dϕ bin fitting is not reasonable
- 3. p_T
  - no p_T dependence
- 4. Coarse binning is ongoing to get reasonable Upsilon 2S v2

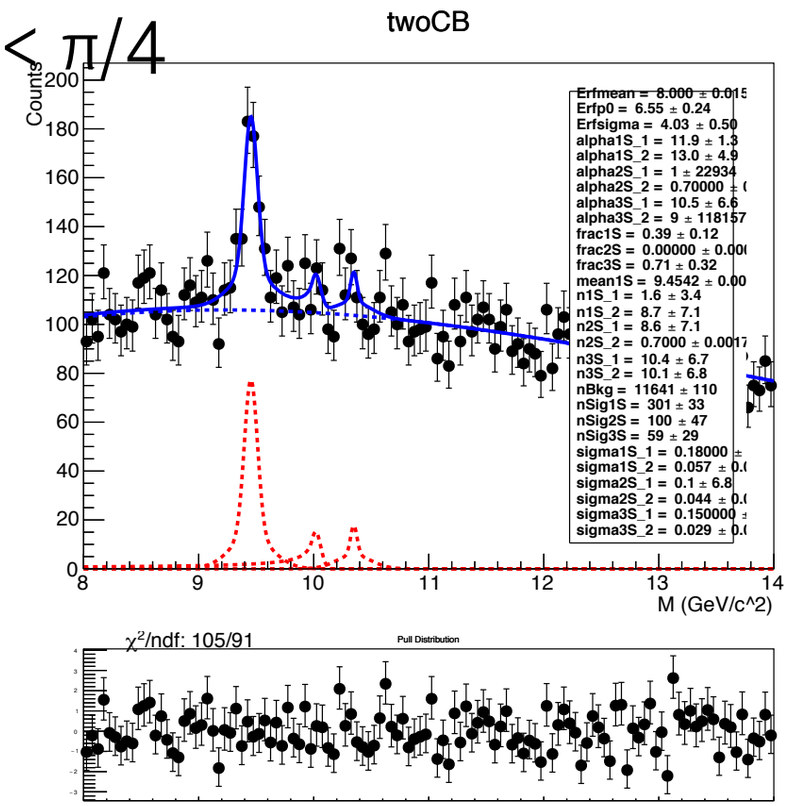
back up

Mass distribution(0 ≤ |y| < 1.2)

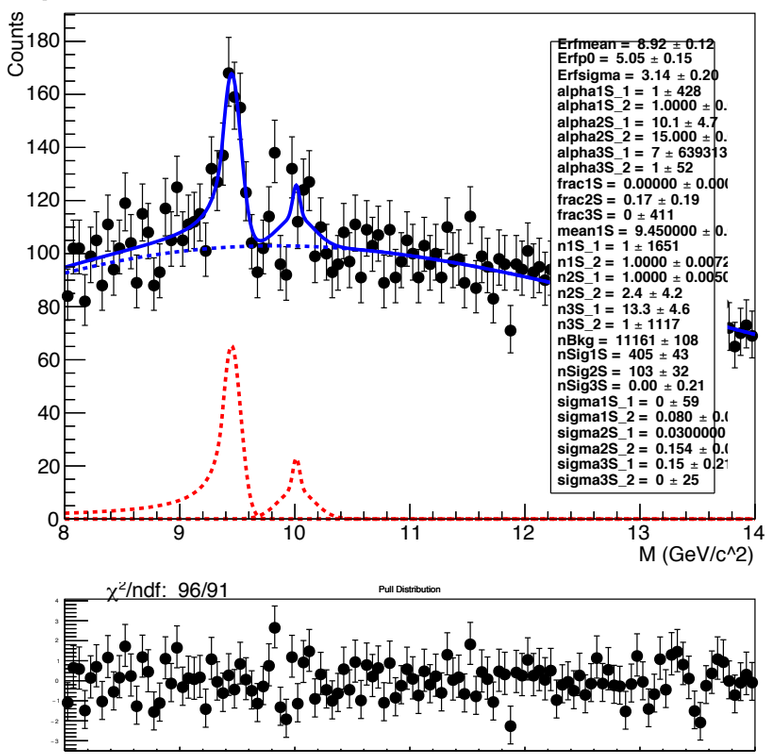
$0 \le d\phi < \pi/8$



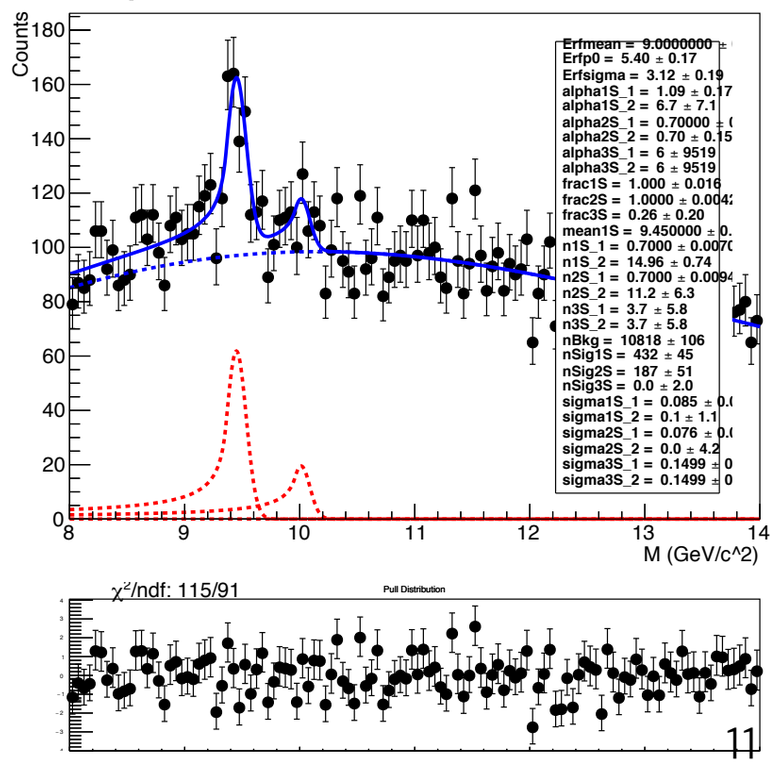
$\pi/8 \le d\phi < \pi/4$



$\pi/4 \le d\phi < 3\pi/8$

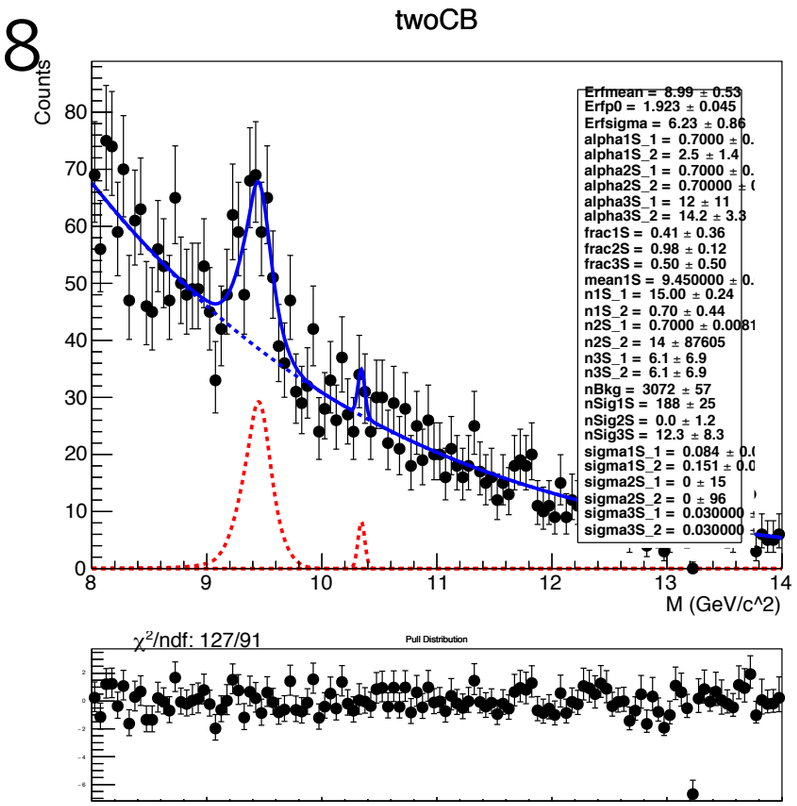


$3\pi/8 \le d\phi < \pi/2$

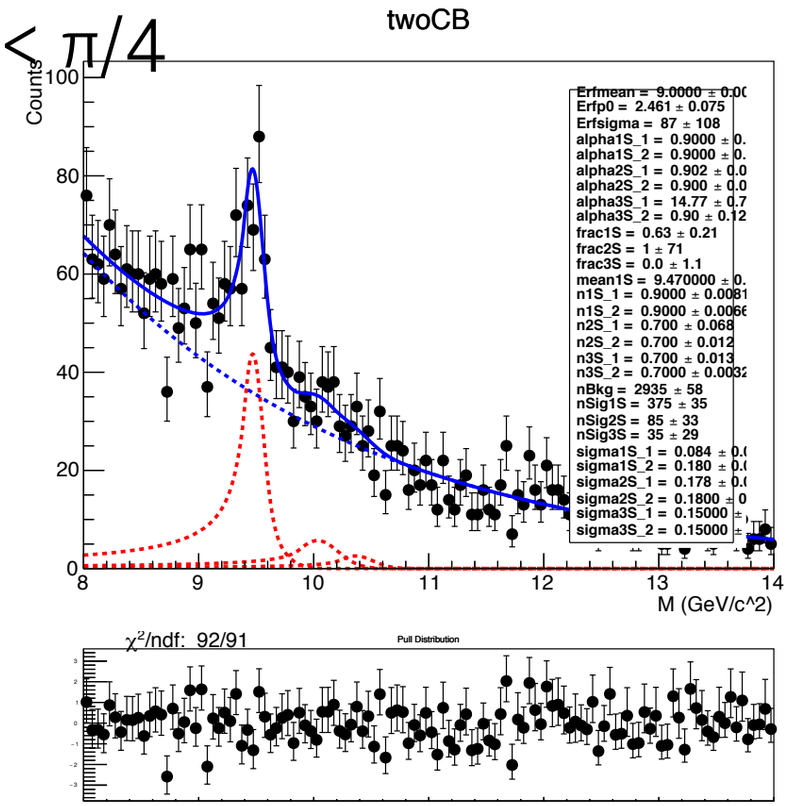


Mass distribution(1.2 ≤ |y| < 2.4)

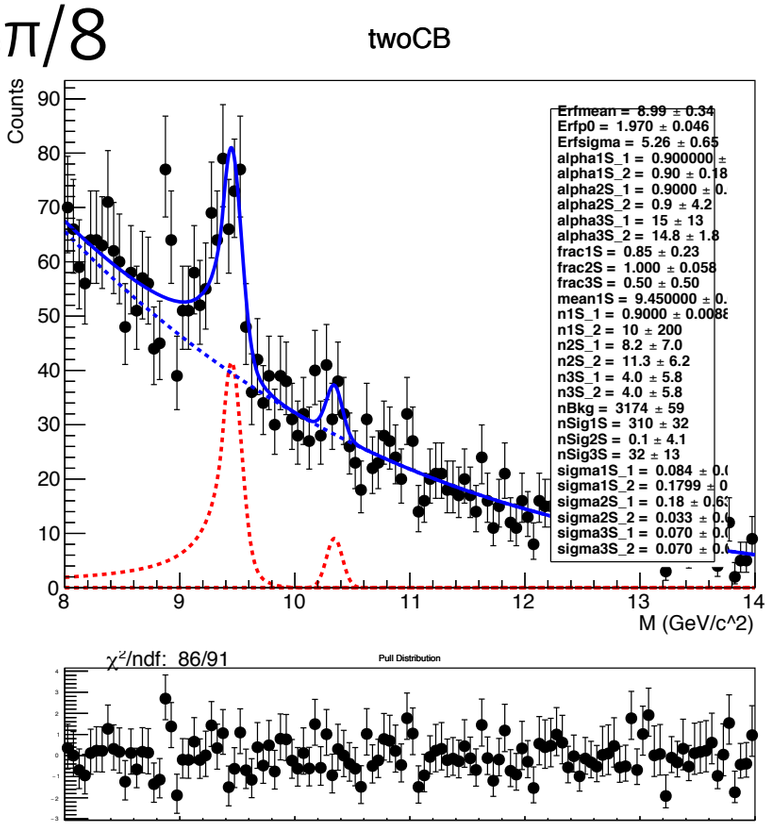
$0 \le d\phi < \pi/8$



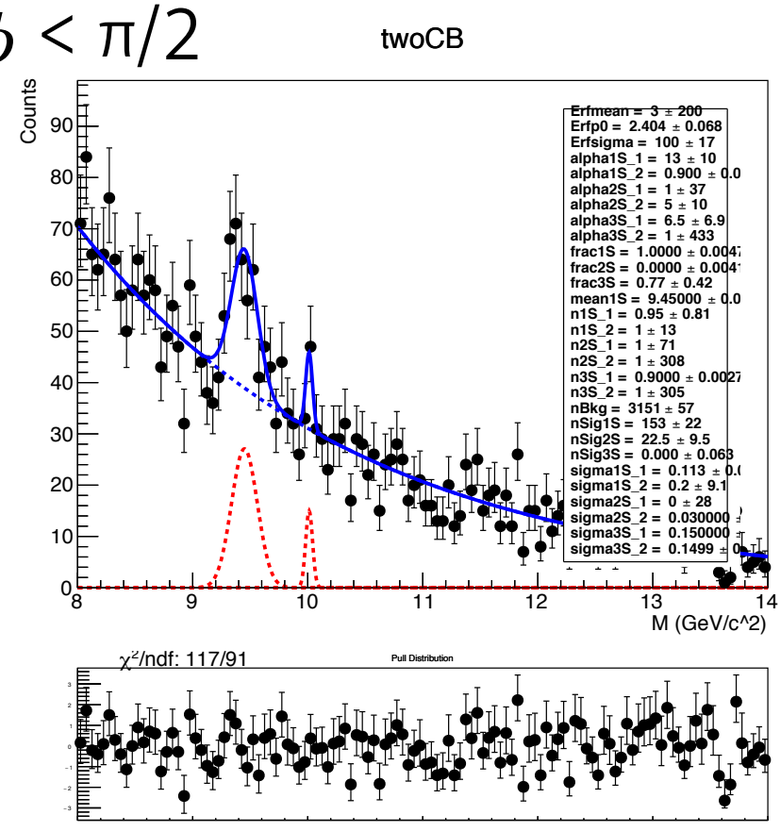
$\pi/8 \le d\phi < \pi/4$



$\pi/4 \le d\phi < 3\pi/8$

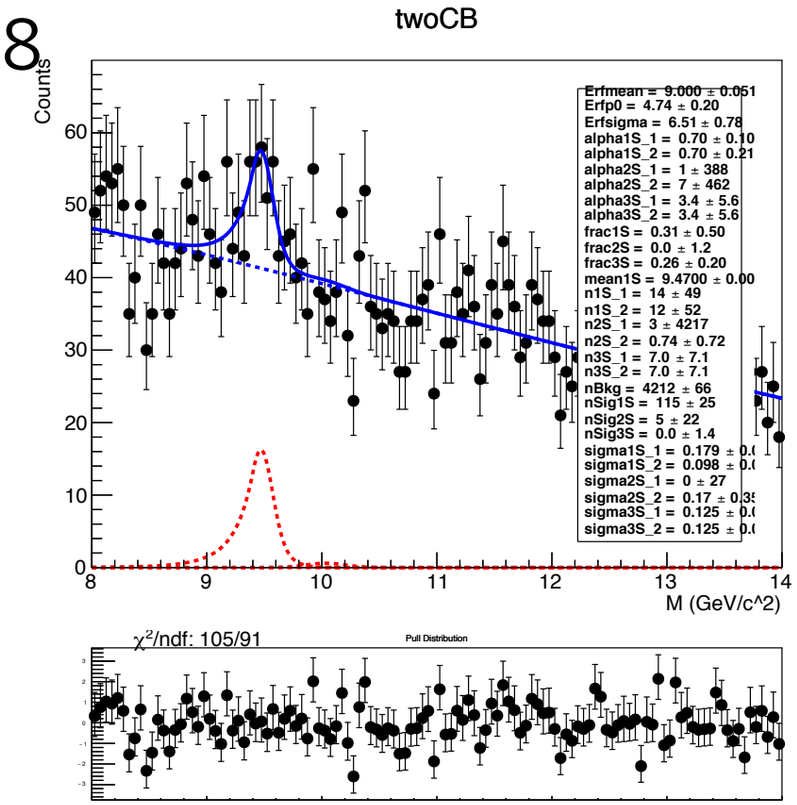


$3\pi/8 \le d\phi < \pi/2$

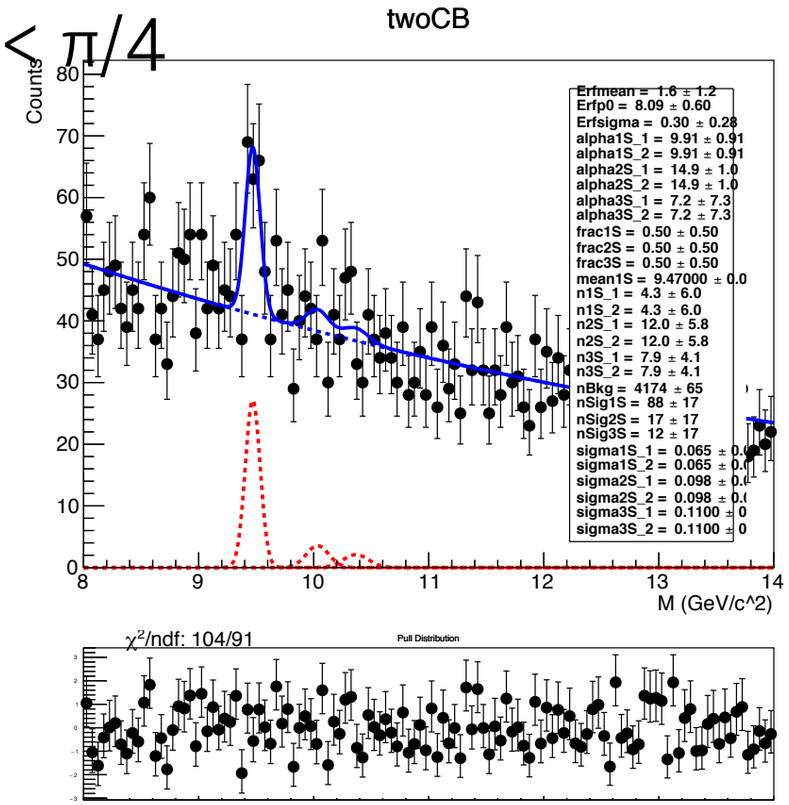


Mass distribution(20 ≤ |Centrality| < 30)

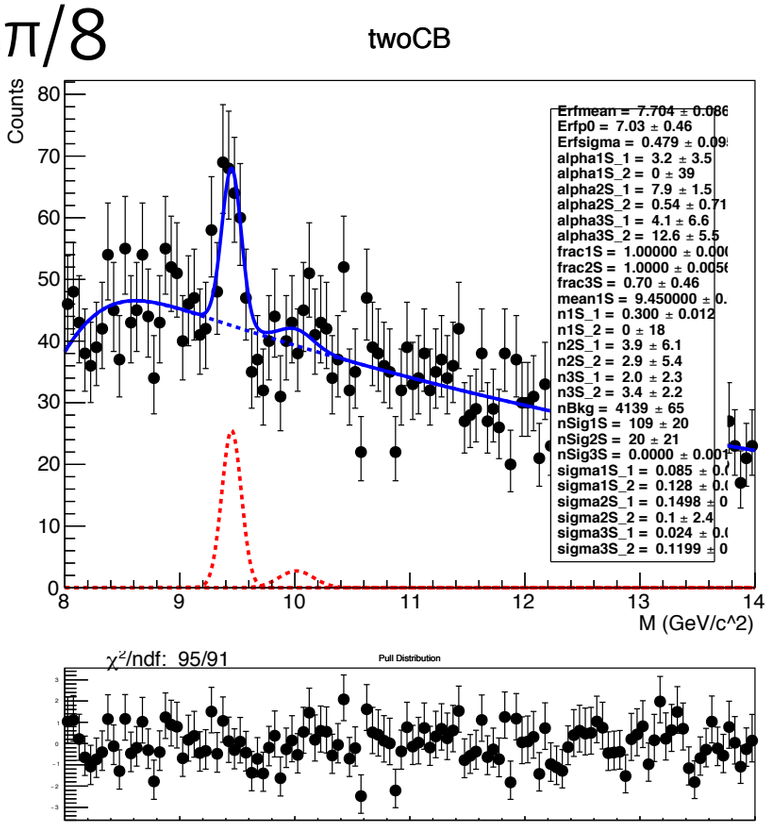
$0 \le d\phi < \pi/8$



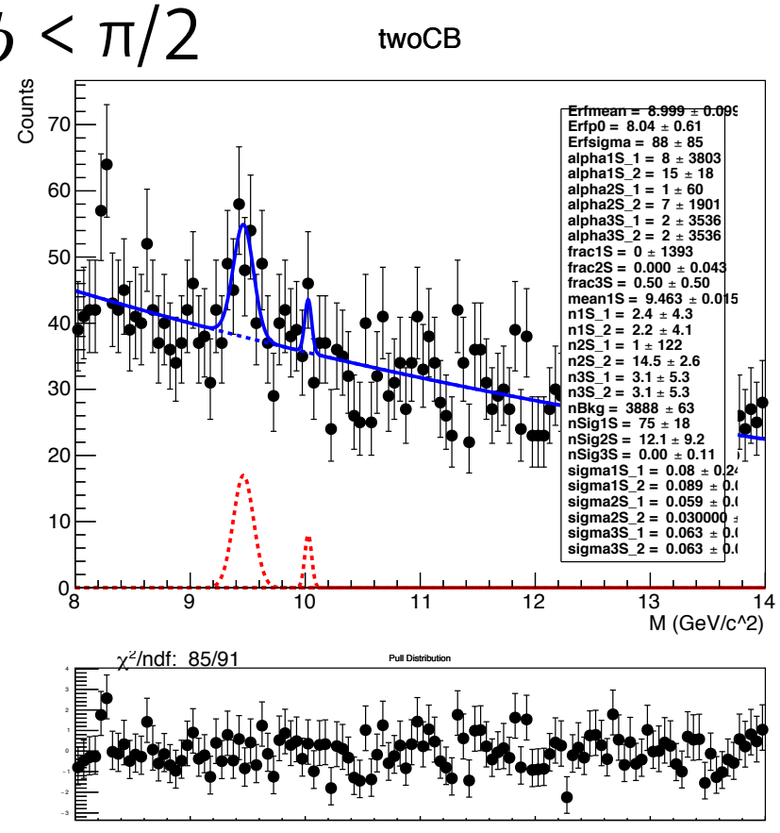
$\pi/8 \le d\phi < \pi/4$



$\pi/4 \le d\phi < 3\pi/8$

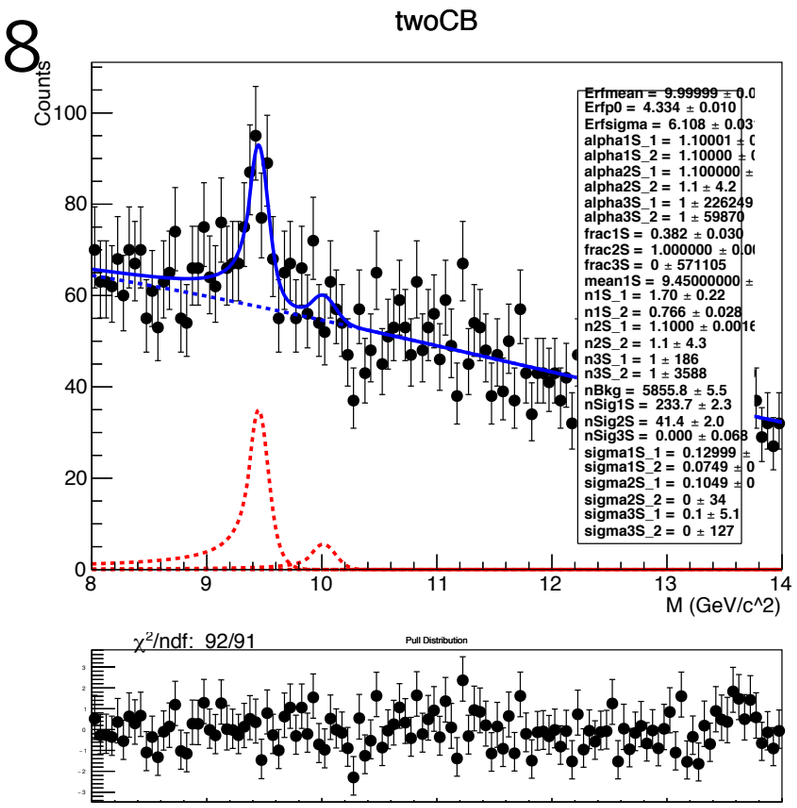


$3\pi/8 \le d\phi < \pi/2$

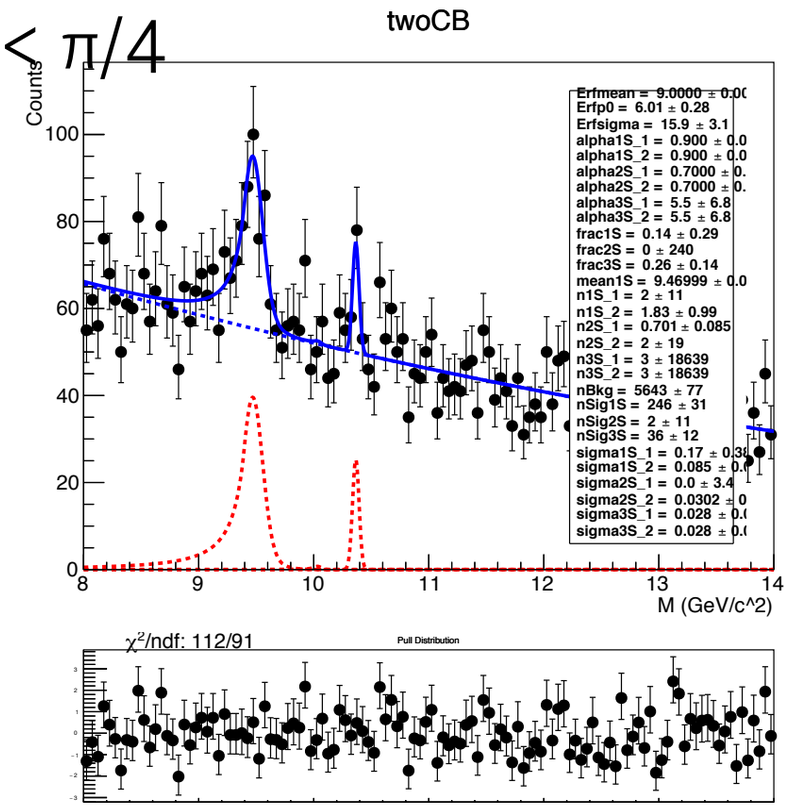


Mass distribution(30 ≤ |Centrality| < 50)

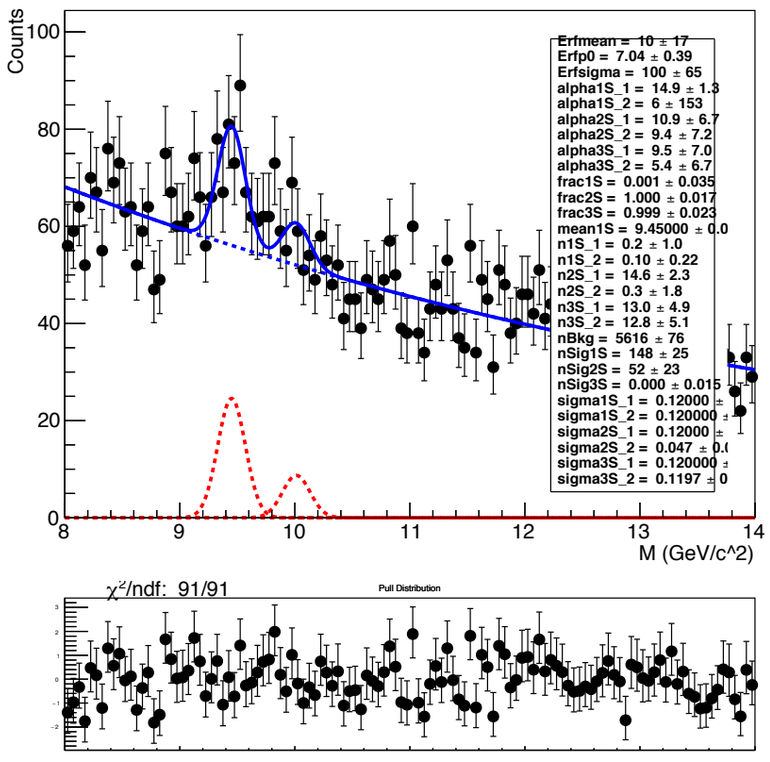
$0 \le d\phi < \pi/8$



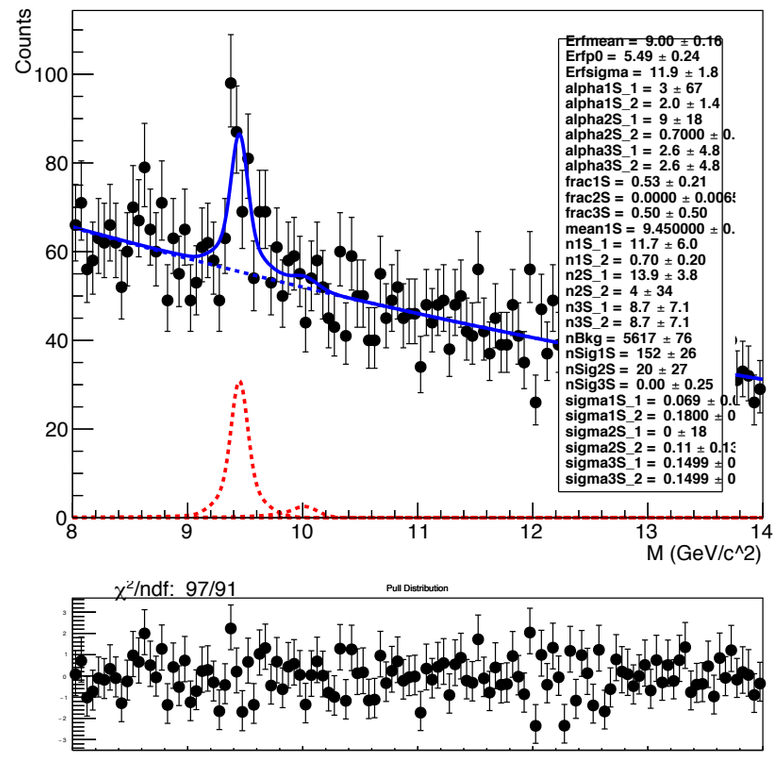
$\pi/8 \le d\phi < \pi/4$



$\pi/4 \le d\phi < 3\pi/8$

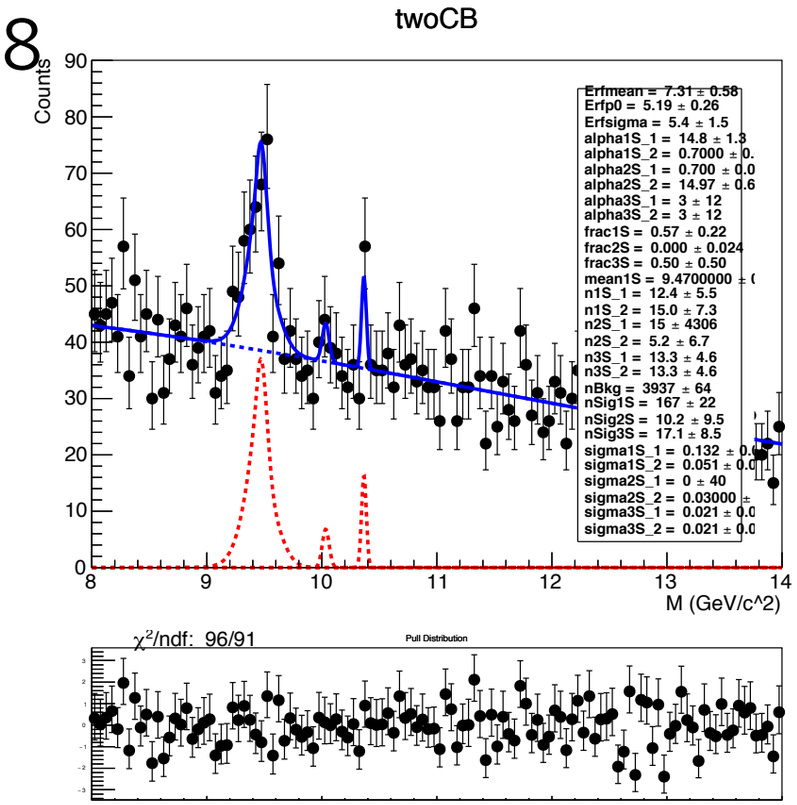


$3\pi/8 \le d\phi < \pi/2$

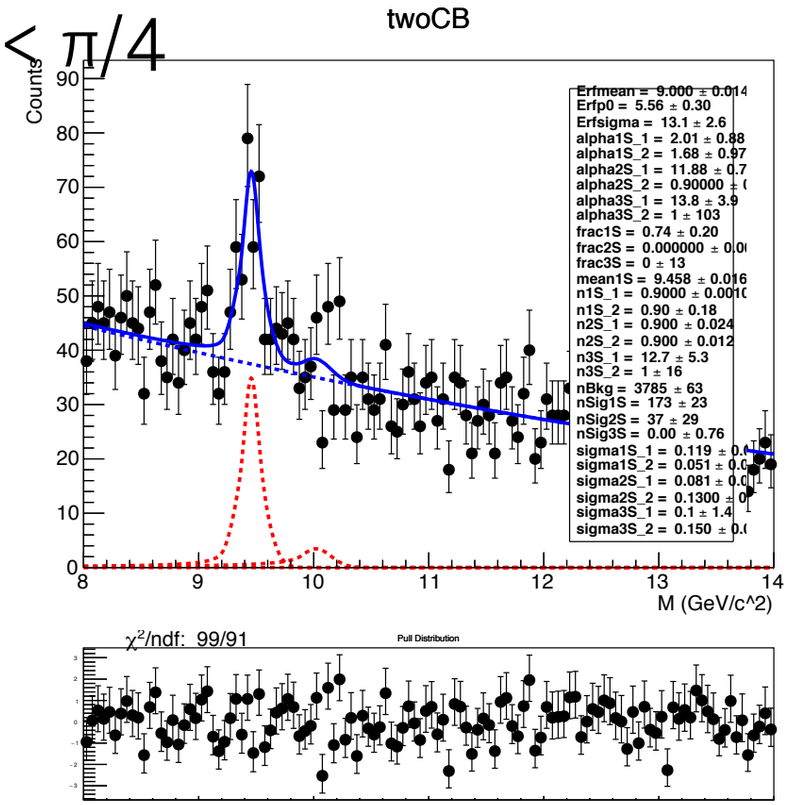


Mass distribution(50 ≤ |Centrality| < 80)

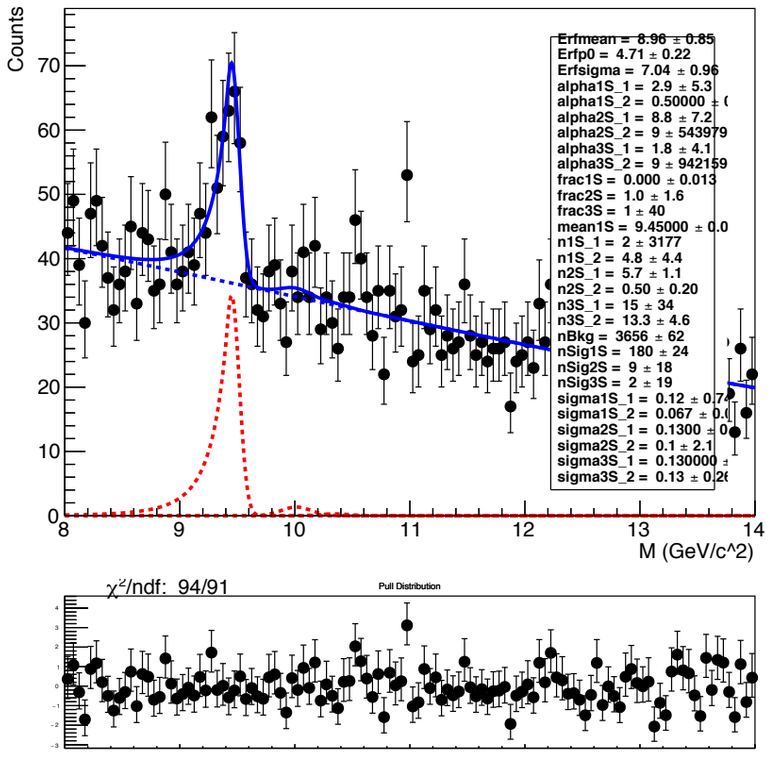
$0 \le d\phi < \pi/8$



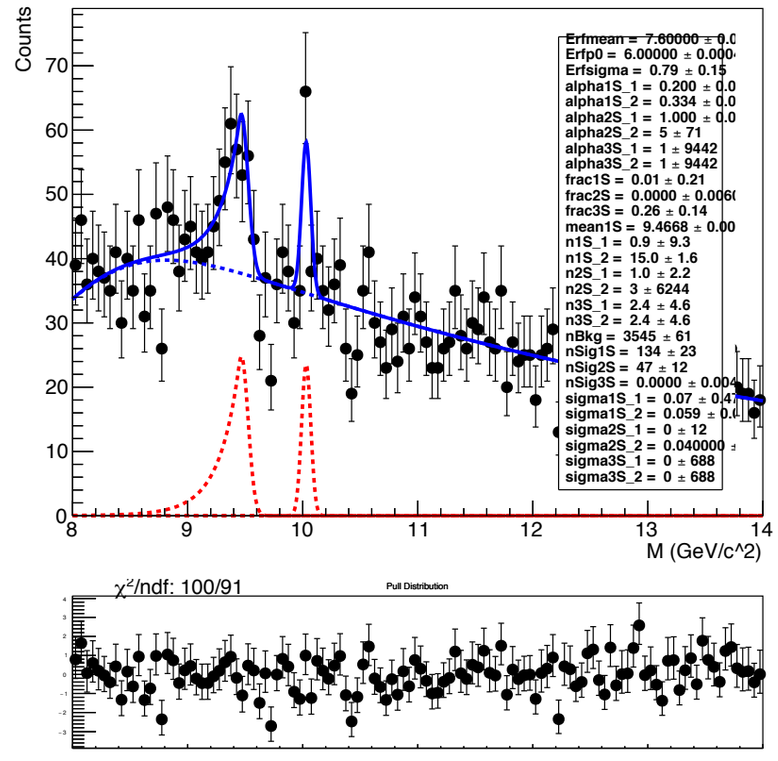
$\pi/8 \le d\phi < \pi/4$



$\pi/4 \le d\phi < 3\pi/8$

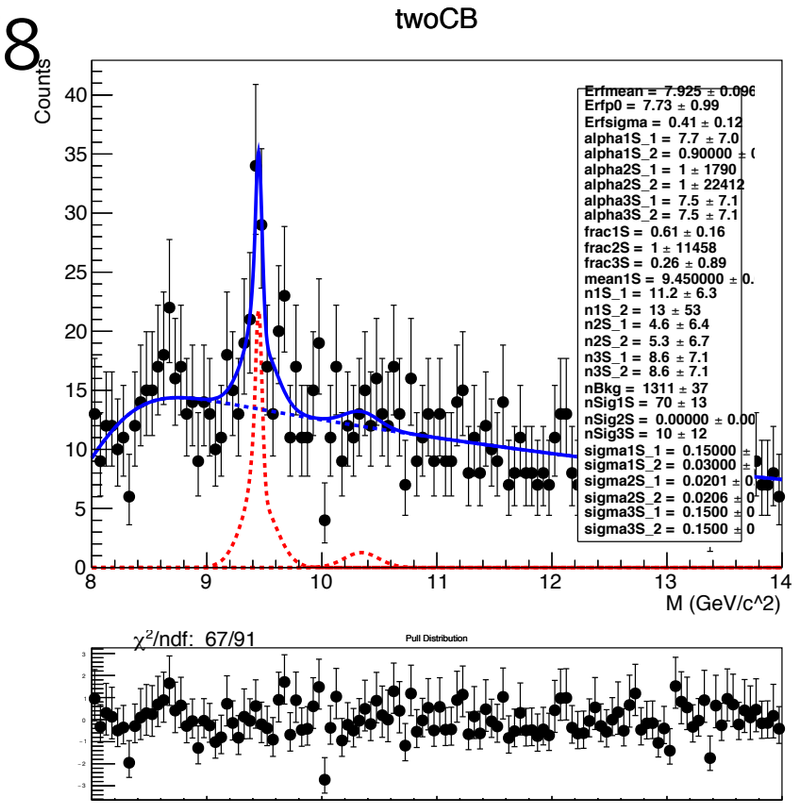


$3\pi/8 \le d\phi < \pi/2$

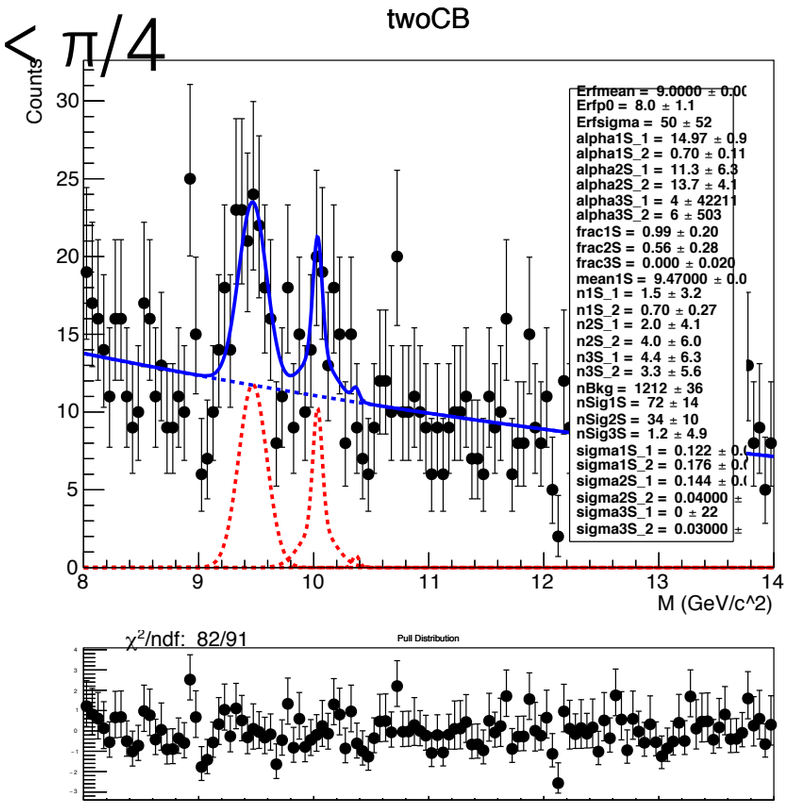


Mass distribution(80 ≤ |Centrality| < 120)

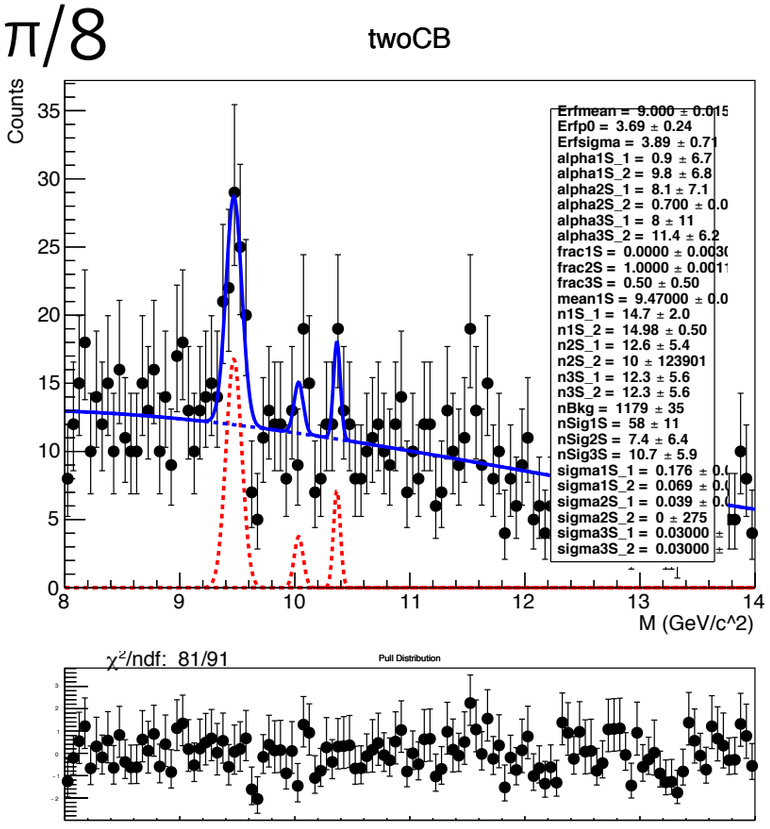
$0 \le d\phi < \pi/8$



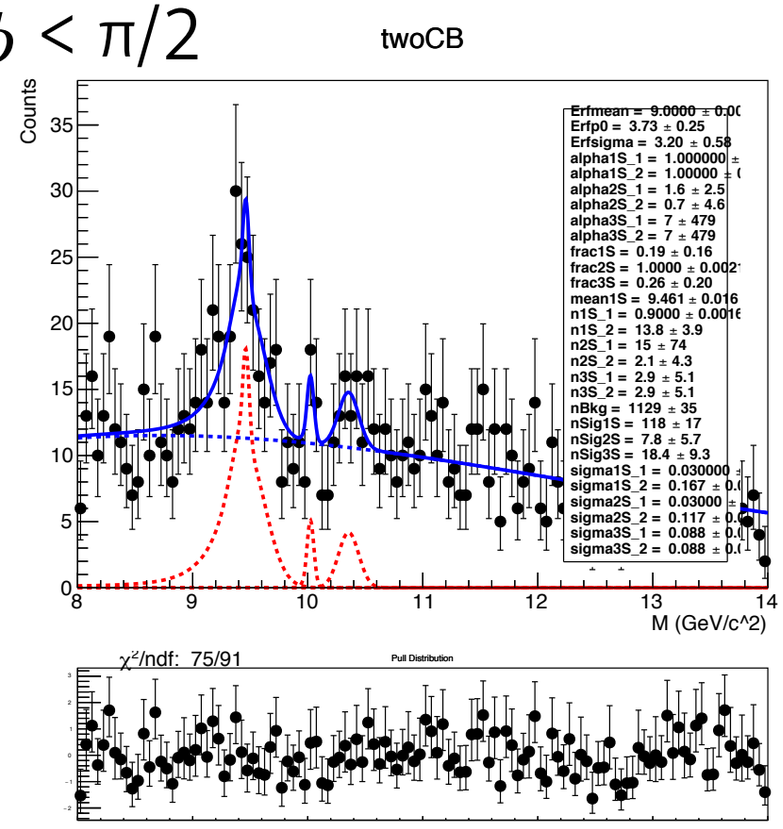
$\pi/8 \le d\phi < \pi/4$



$\pi/4 \le d\phi < 3\pi/8$

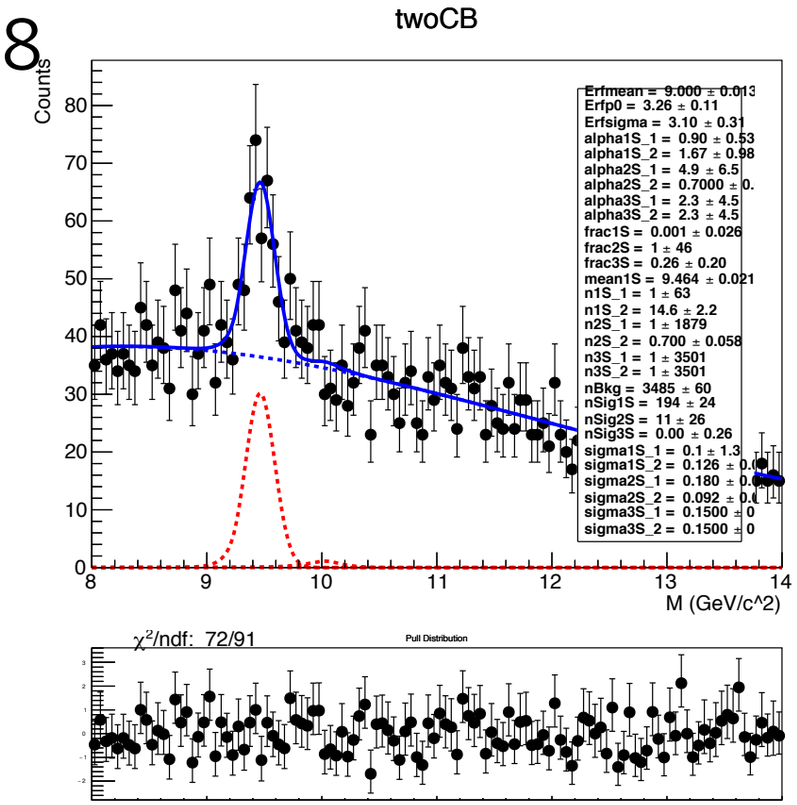


$3\pi/8 \le d\phi < \pi/2$

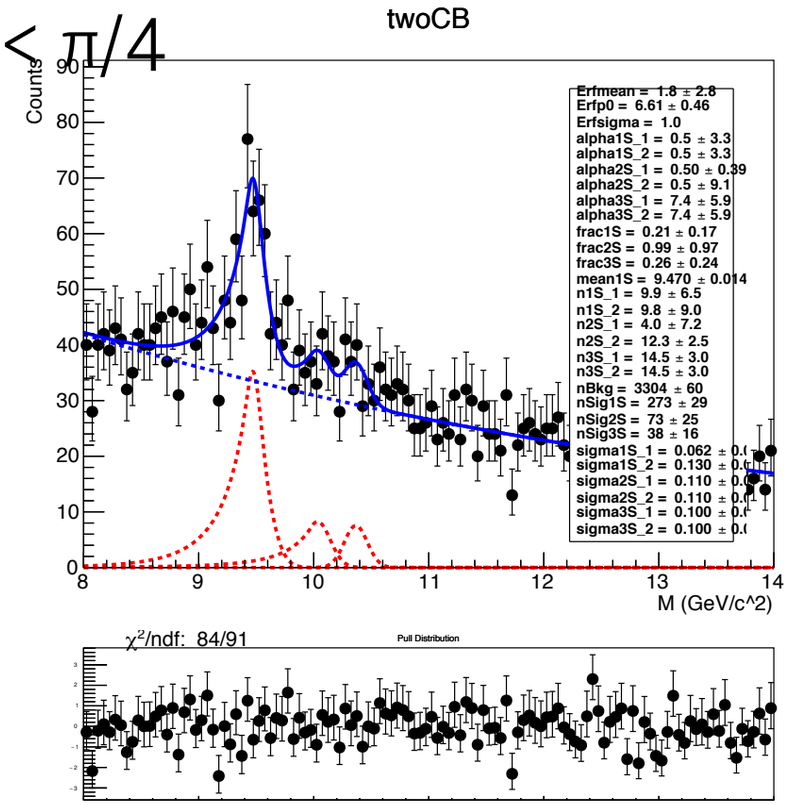


Mass distribution($0 \leq |p_T| < 3$)

$0 \leq d\phi < \pi/8$



$\pi/8 \leq d\phi < \pi/4$

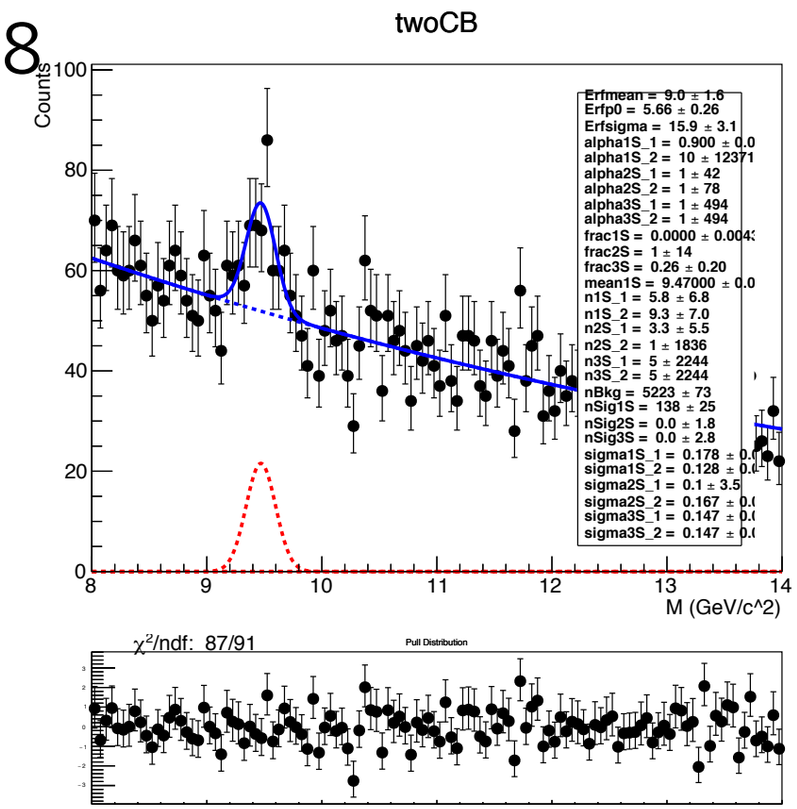


$\pi/4 \leq d\phi < 3\pi/8$

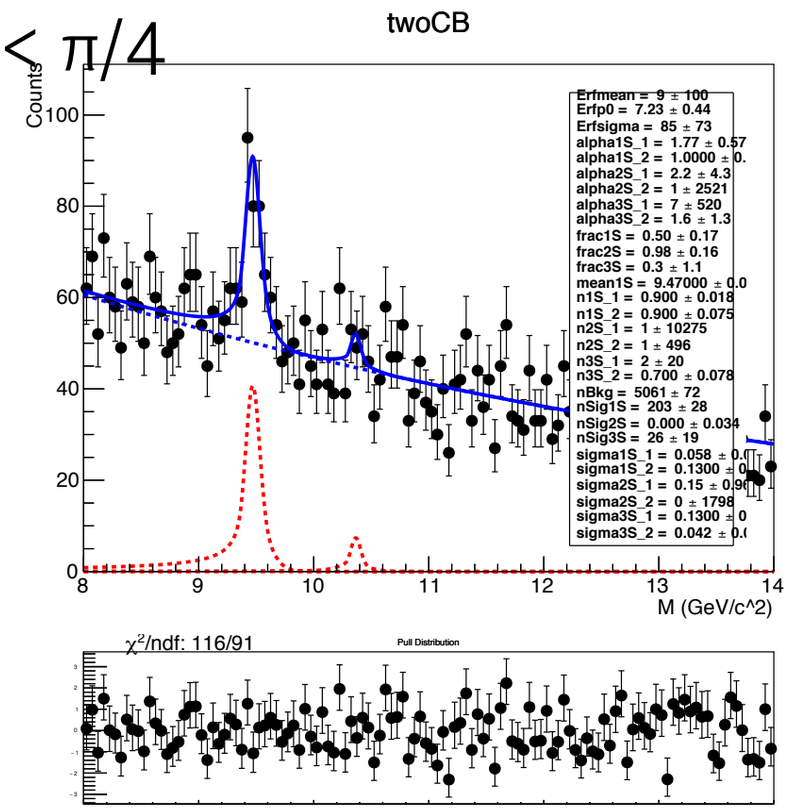
$3\pi/8 \leq d\phi < \pi/2$

Mass distribution($3 \leq |p_T| < 6$)

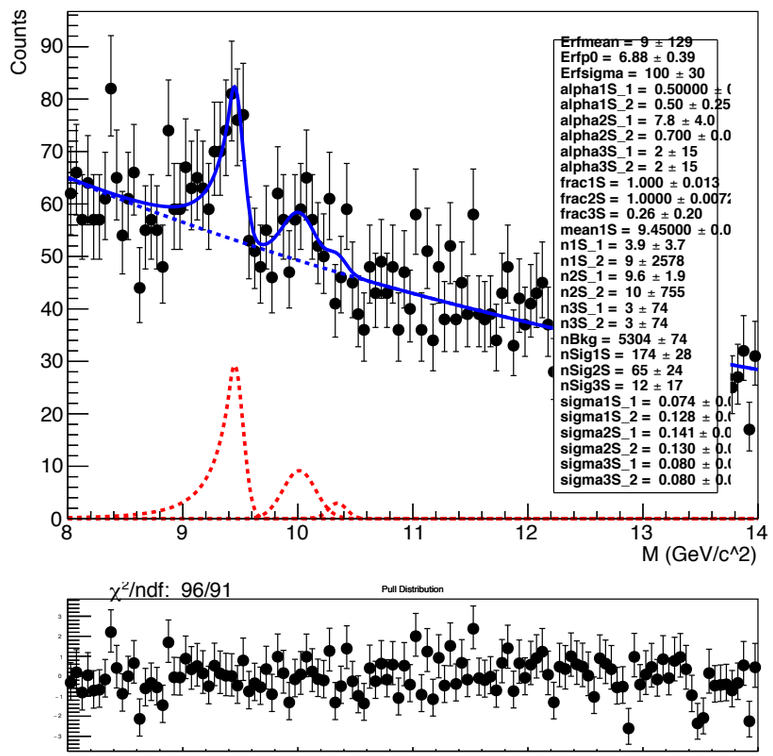
$0 \leq d\phi < \pi/8$



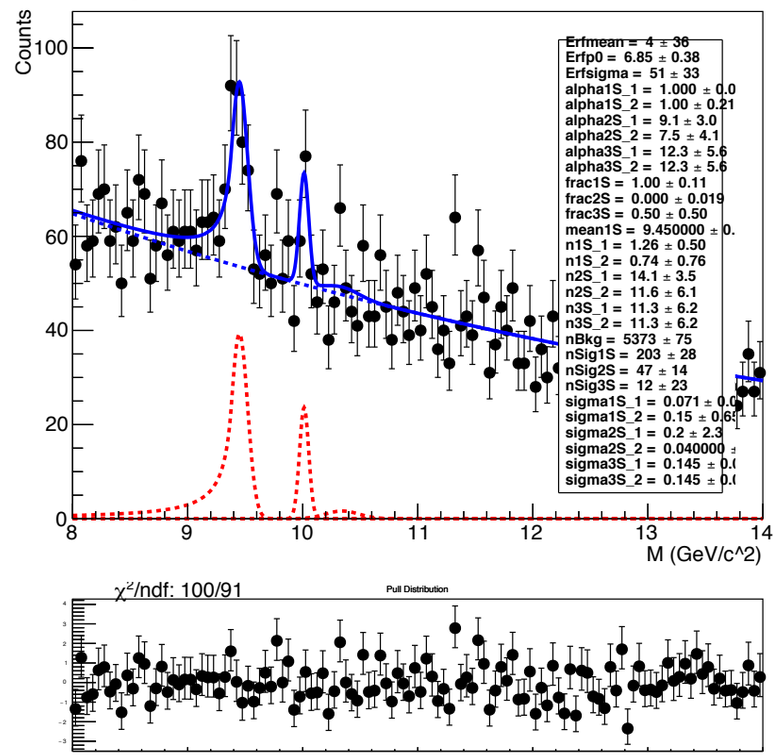
$\pi/8 \leq d\phi < \pi/4$



$\pi/4 \leq d\phi < 3\pi/8$

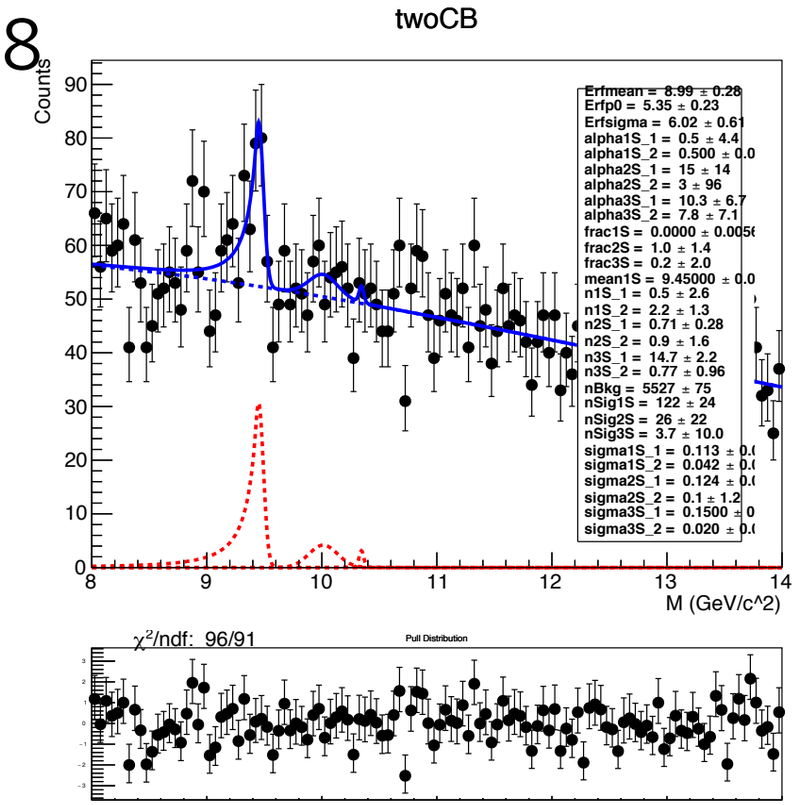


$3\pi/8 \leq d\phi < \pi/2$

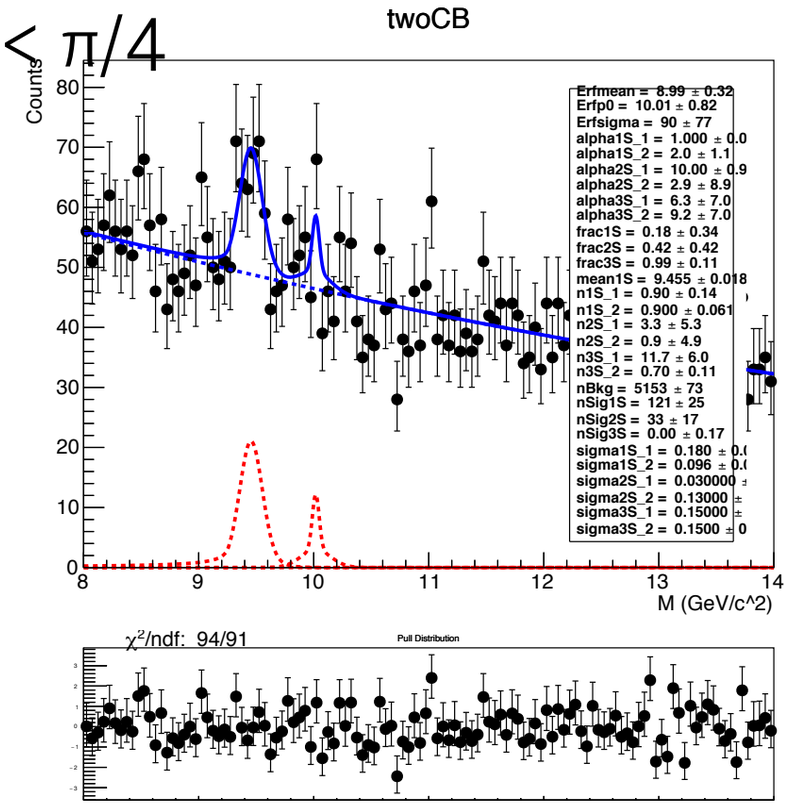


Mass distribution($6 \leq |p_T| < 10$)

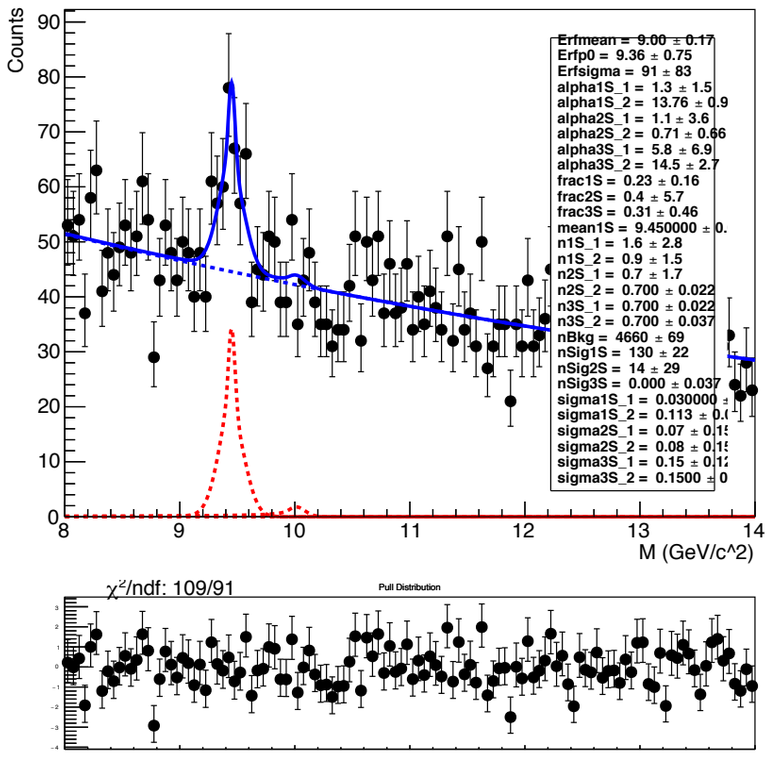
$0 \leq d\phi < \pi/8$



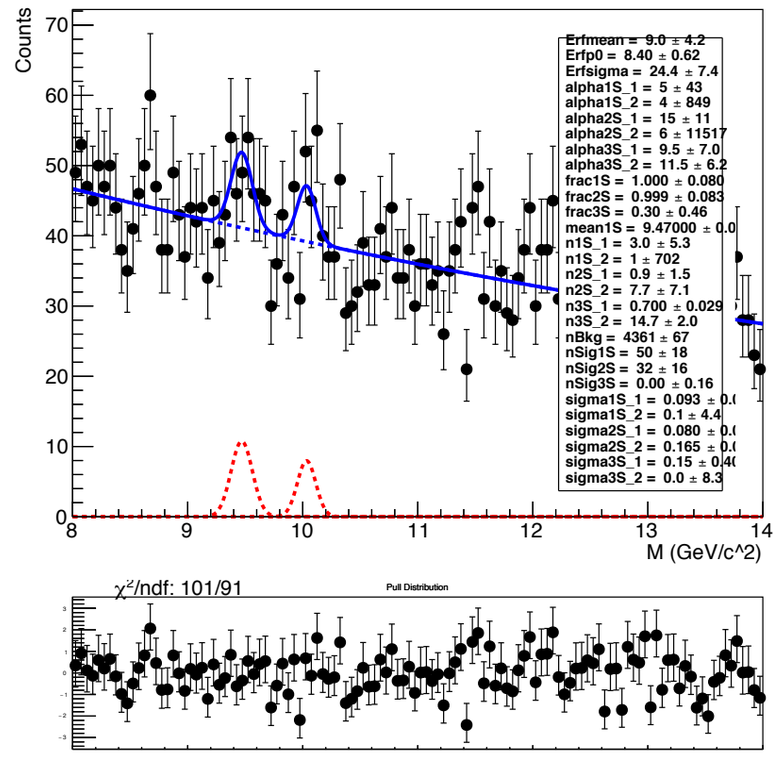
$\pi/8 \leq d\phi < \pi/4$



$\pi/4 \leq d\phi < 3\pi/8$

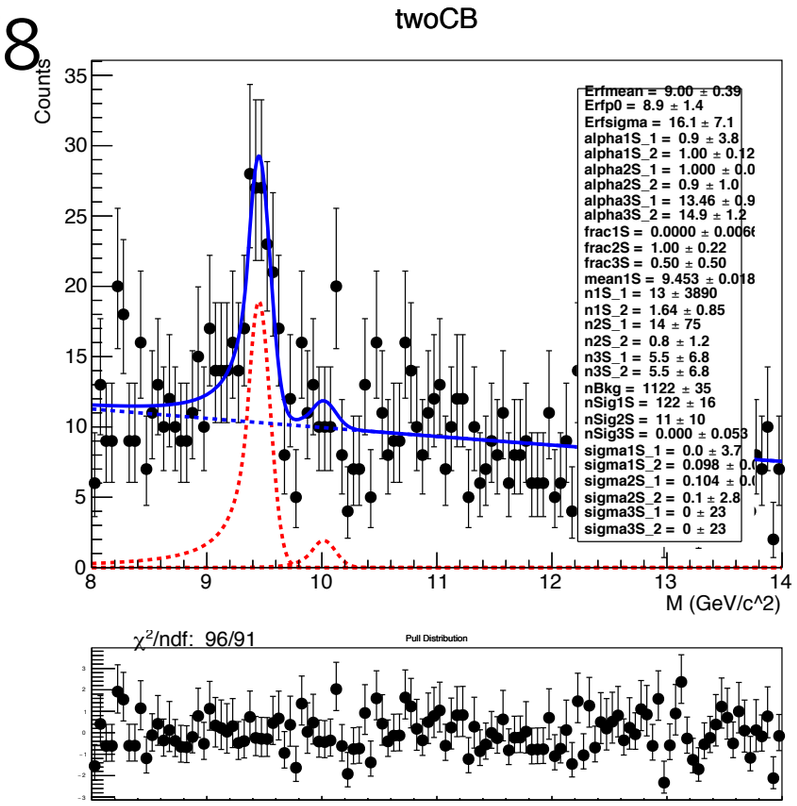


$3\pi/8 \leq d\phi < \pi/2$

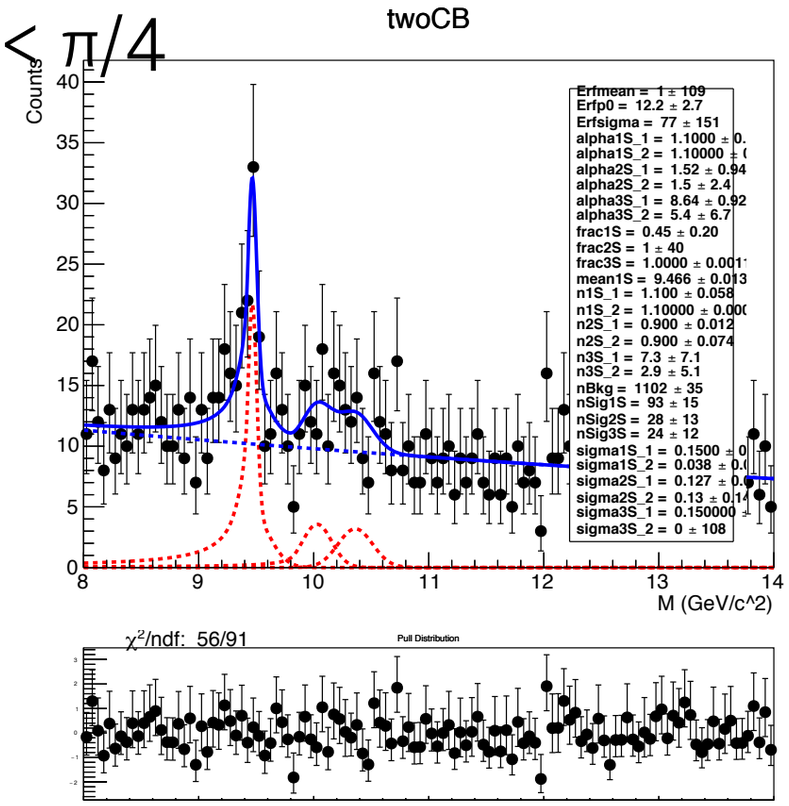


Mass distribution($10 \leq |p_T| < 30$)

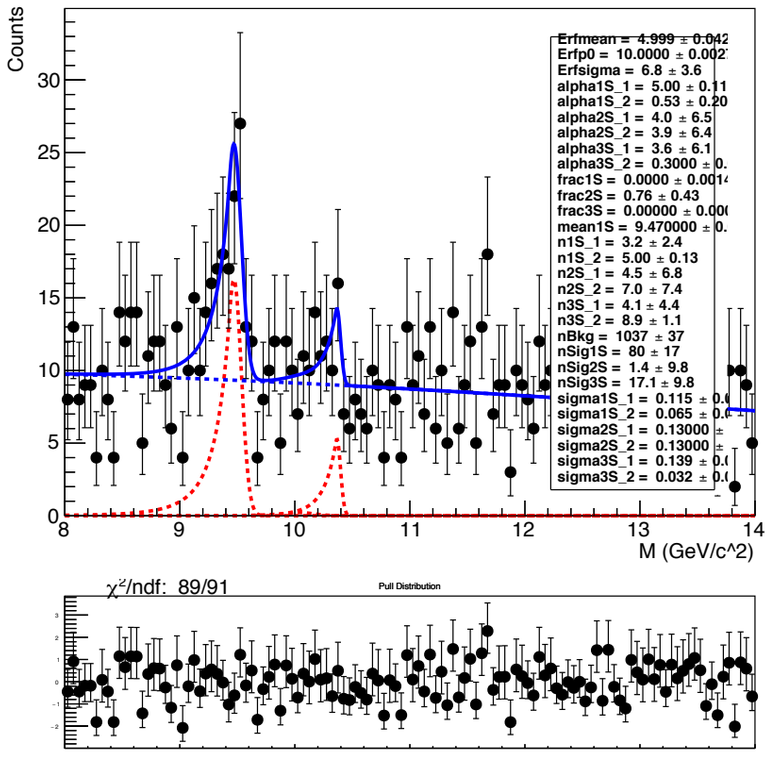
$0 \leq d\phi < \pi/8$



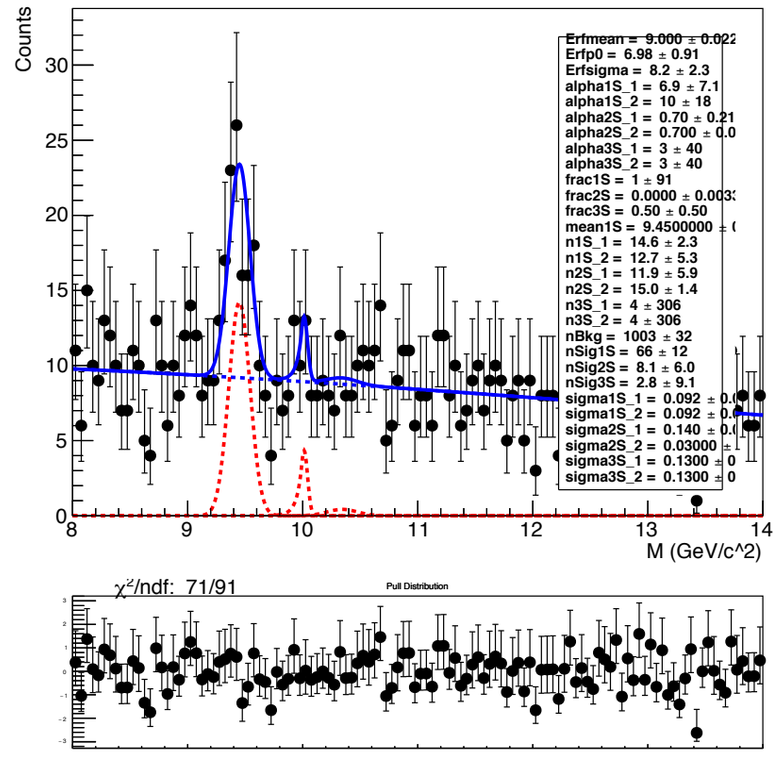
$\pi/8 \leq d\phi < \pi/4$



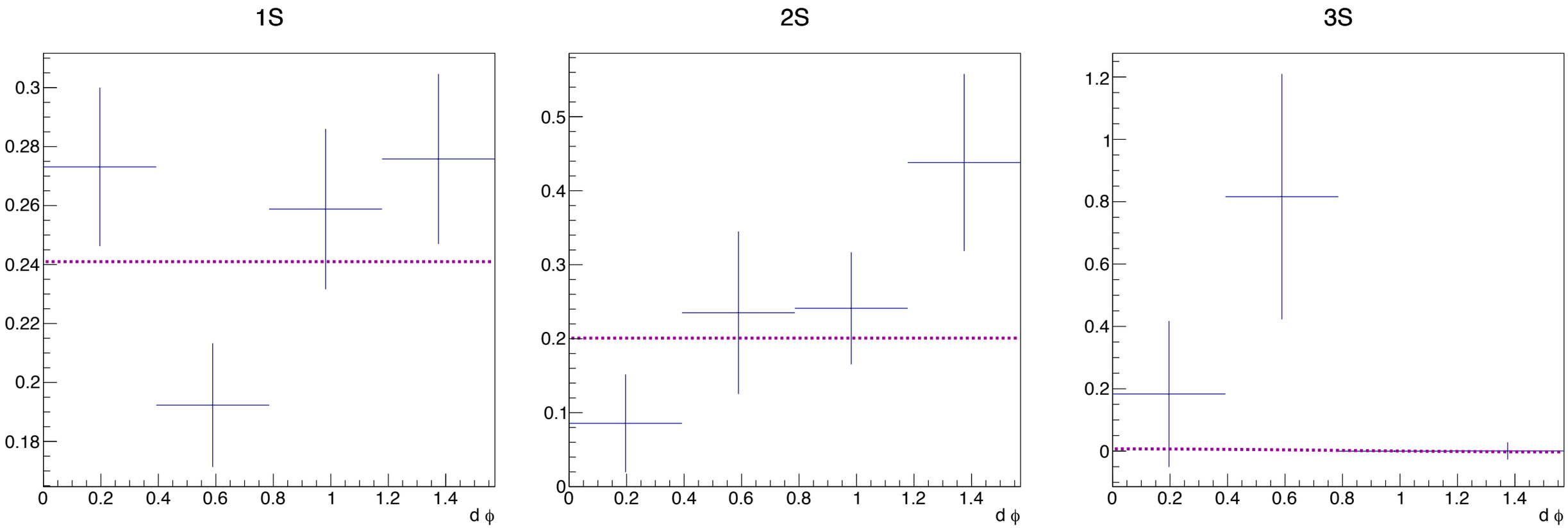
$\pi/4 \leq d\phi < 3\pi/8$



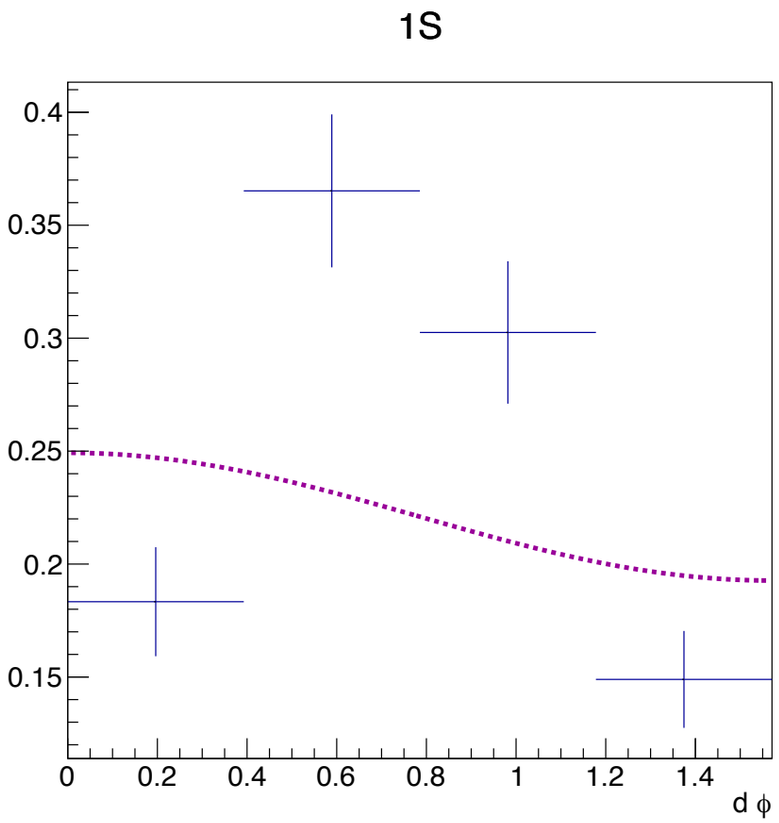
$3\pi/8 \leq d\phi < \pi/2$

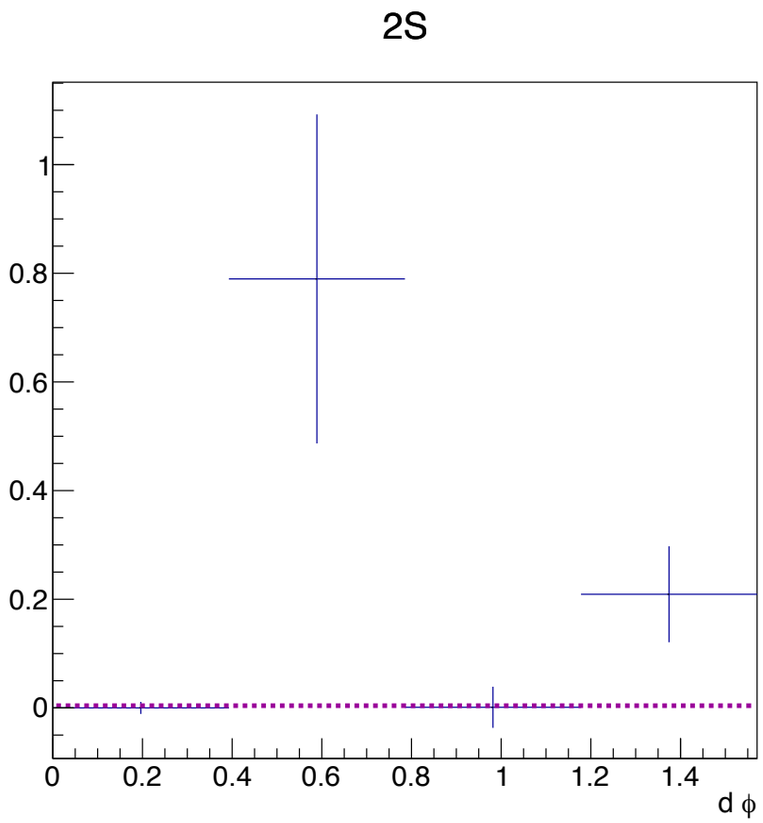


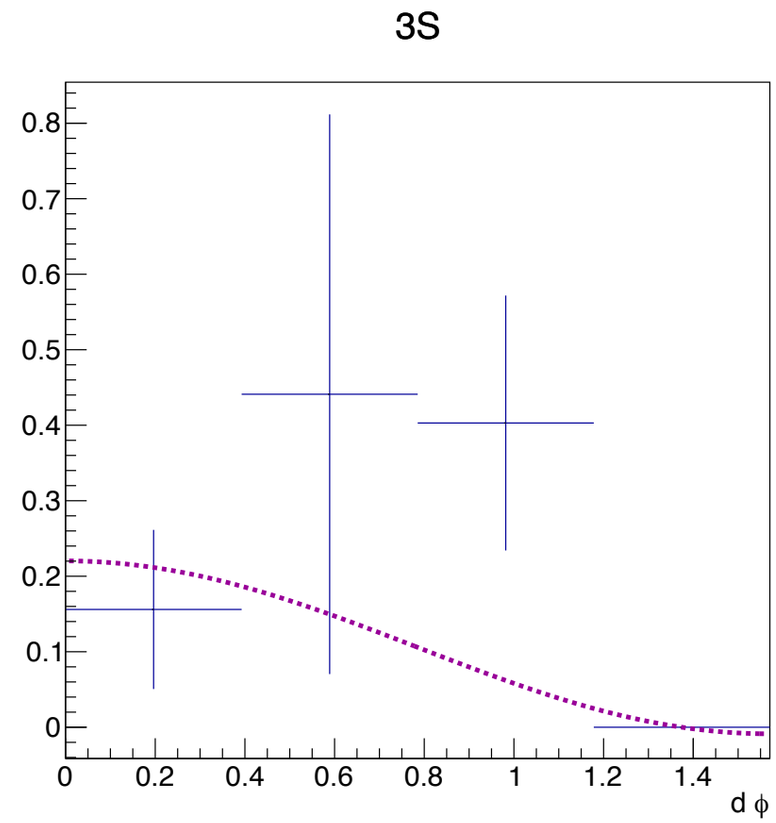
dN/dϕ(0 ≤ |y| < 1.2)



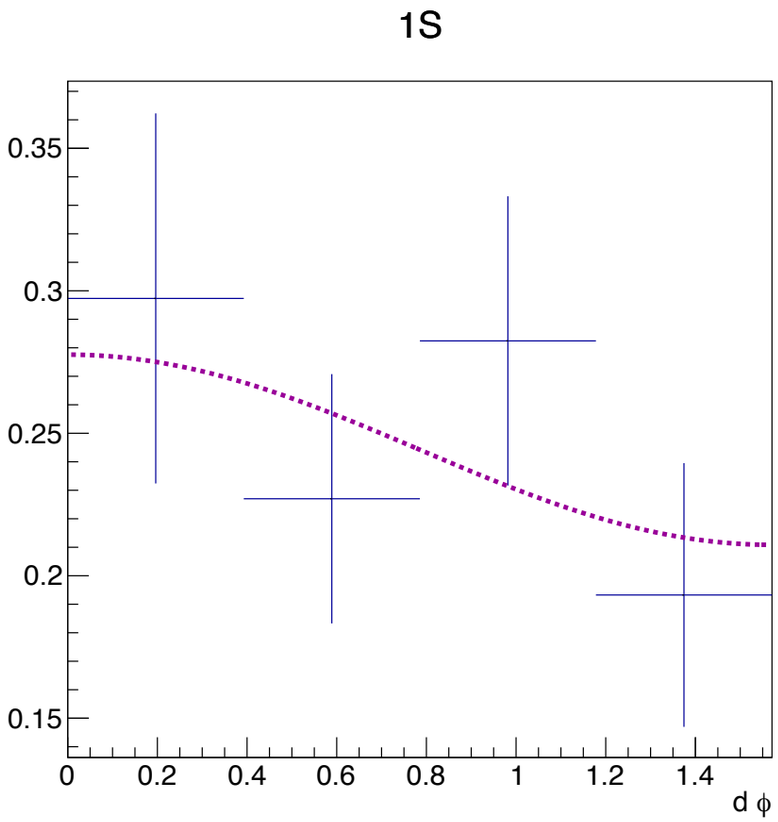
dN/dϕ(1.2 ≤ |y| < 2.4)

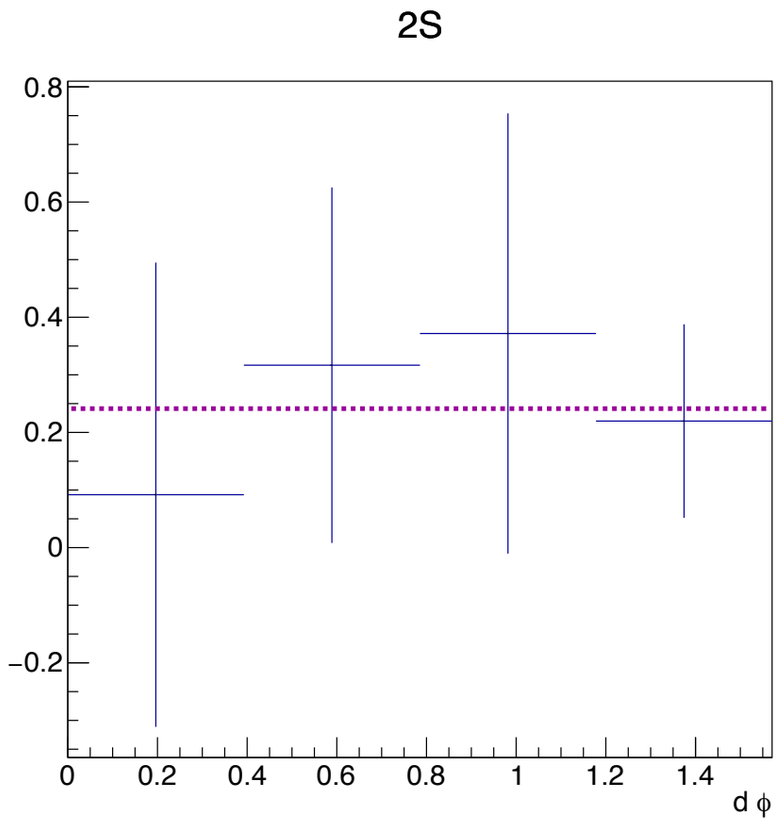


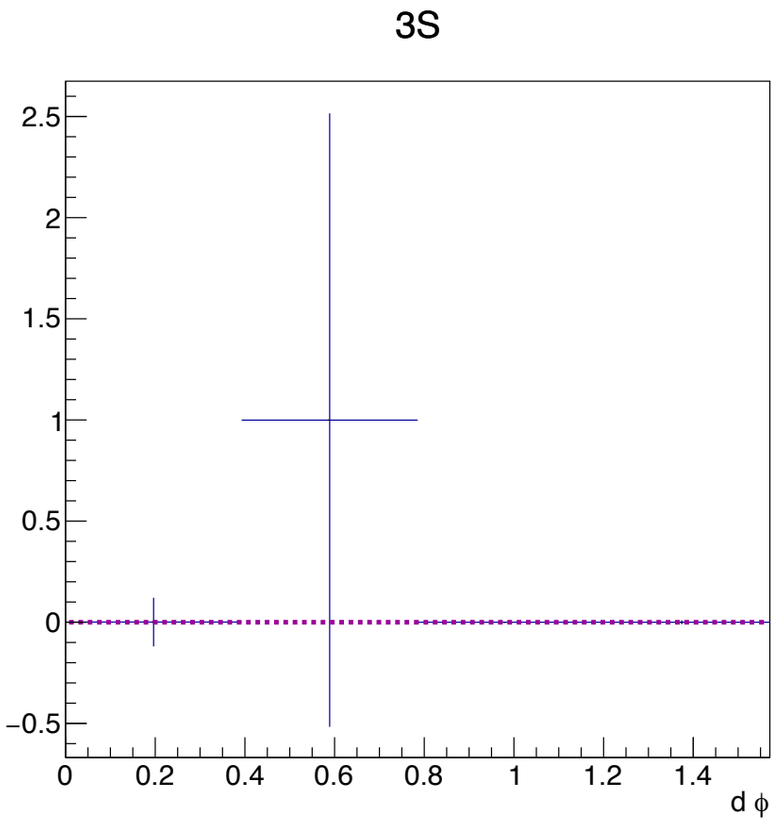




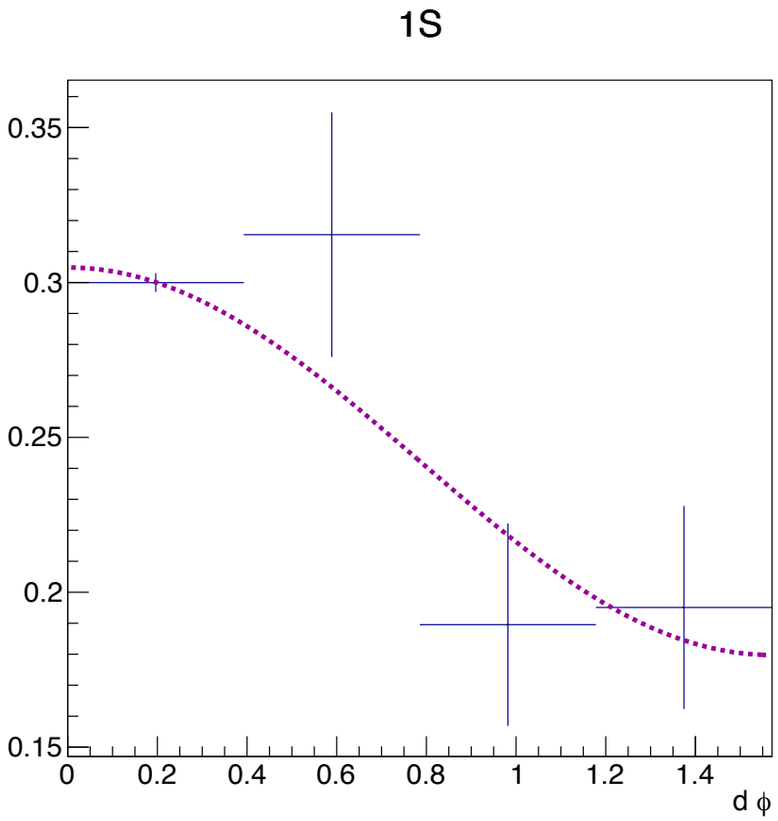
dN/dϕ(20 ≤ |Centrality| < 30)

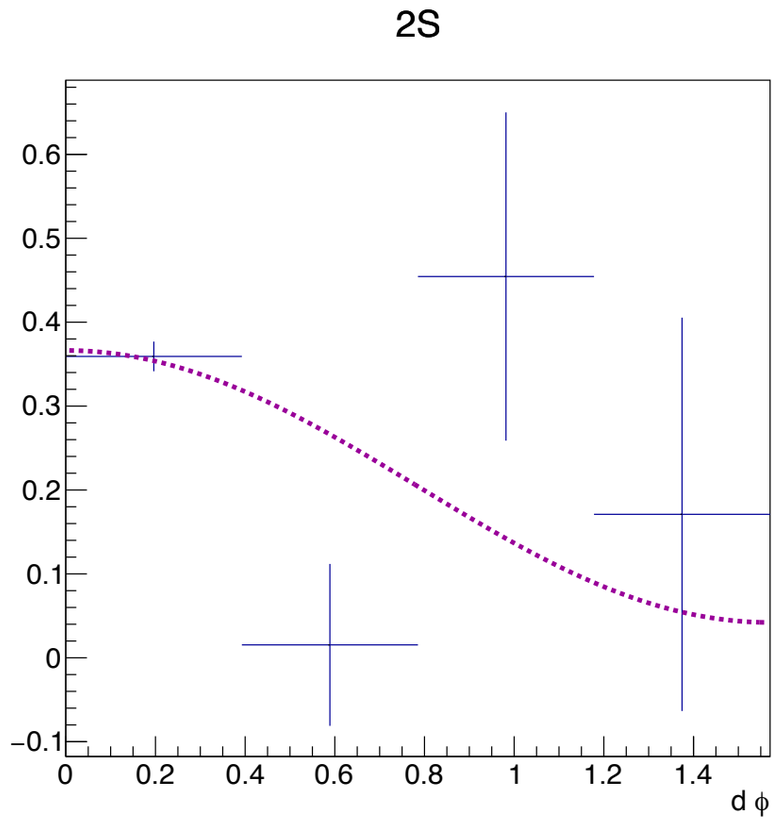


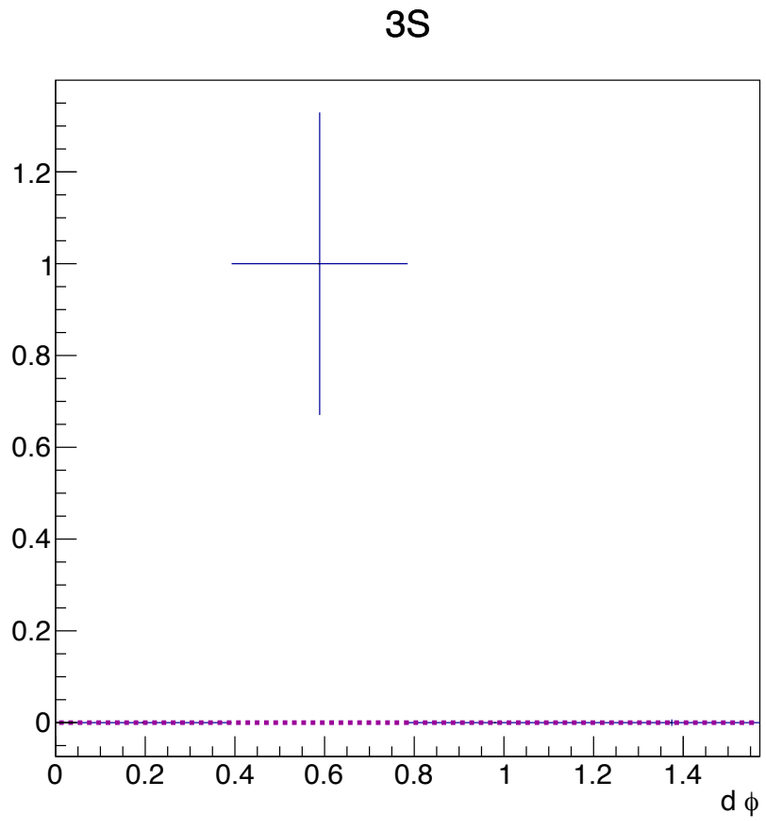




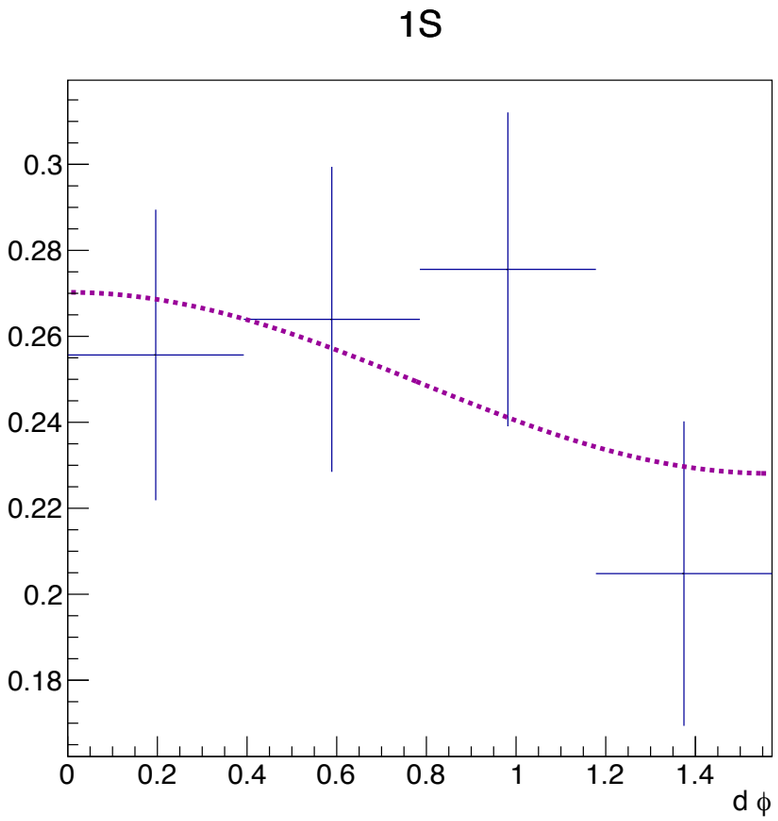
dN/dϕ(30 ≤ |Centrality| < 50)

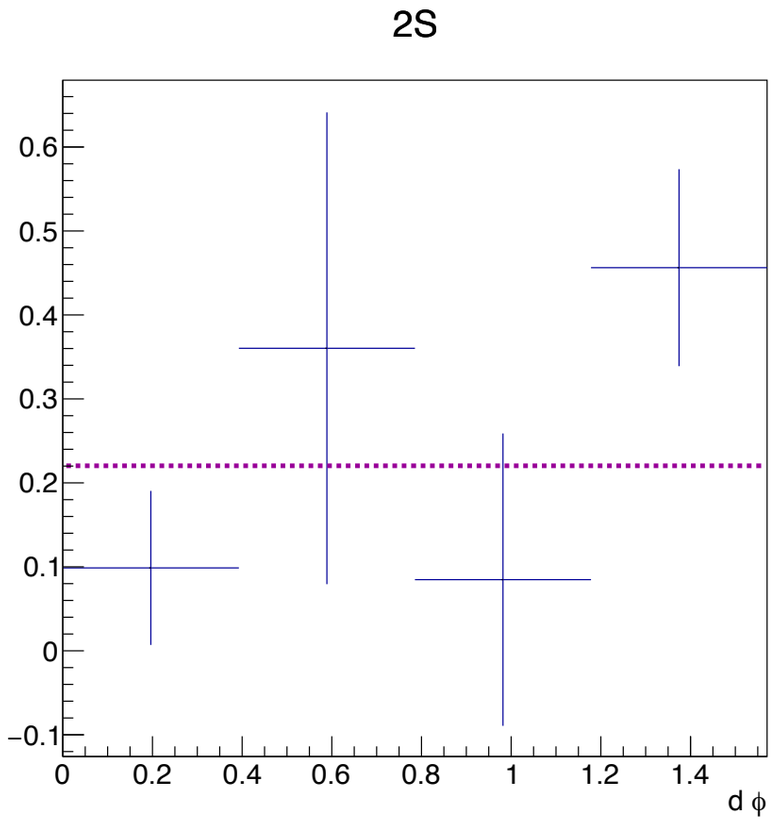


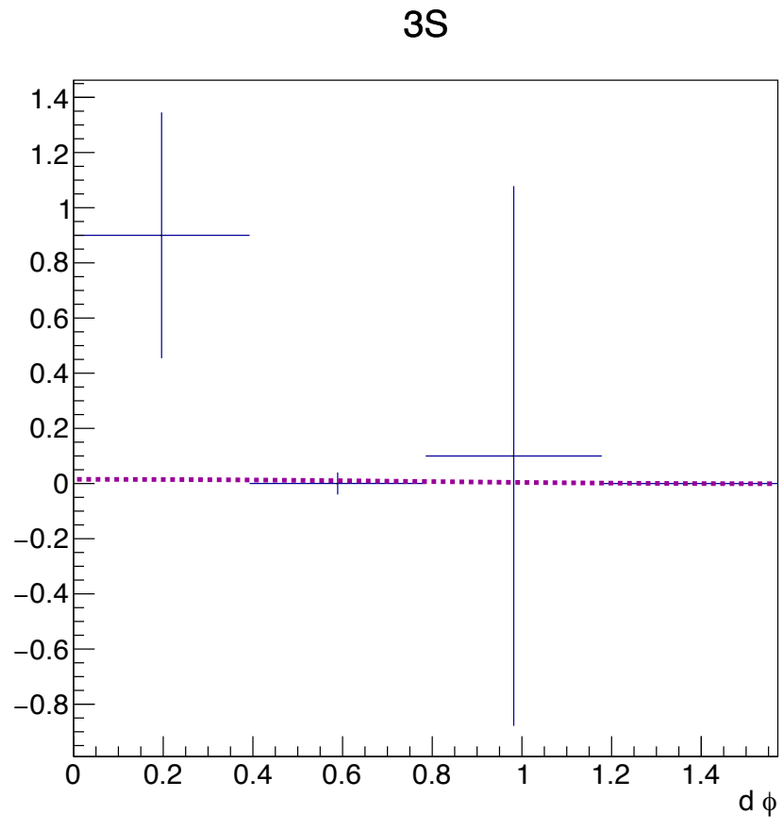




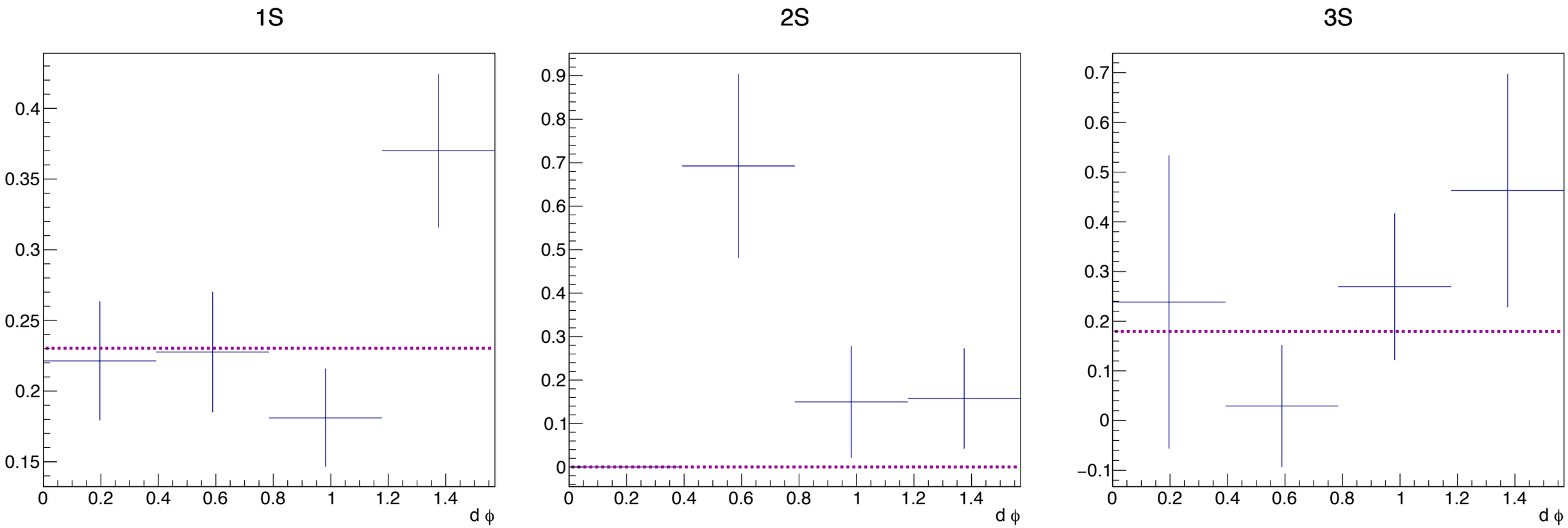
dN/dϕ(50 ≤ |Centrality| < 80)



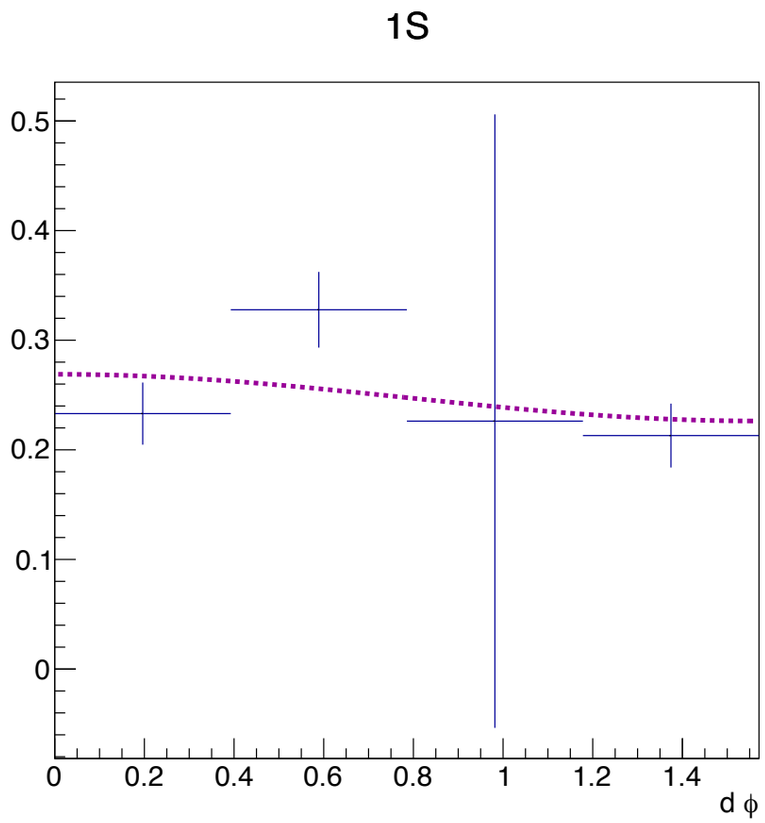


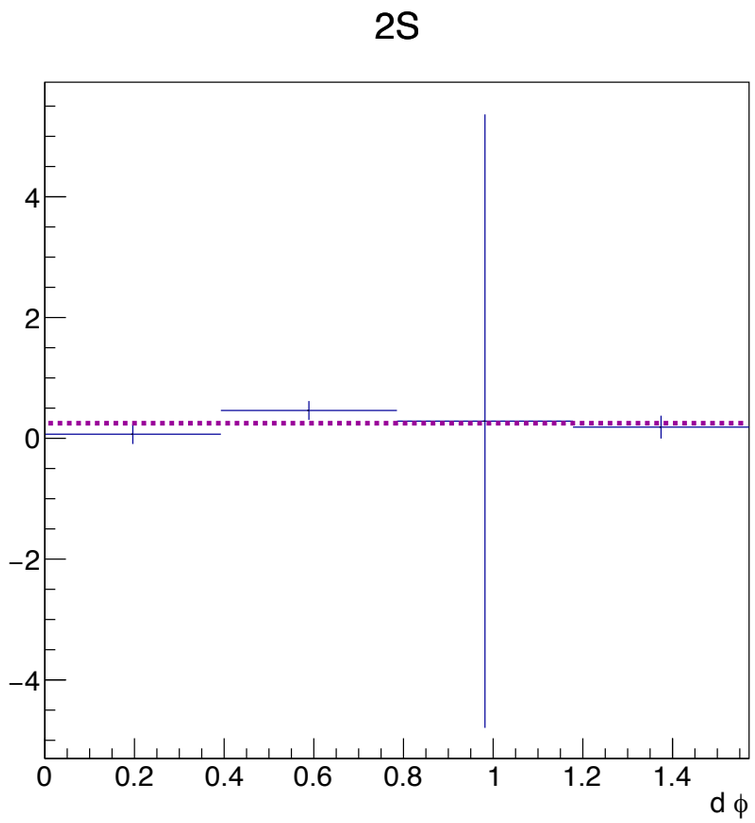


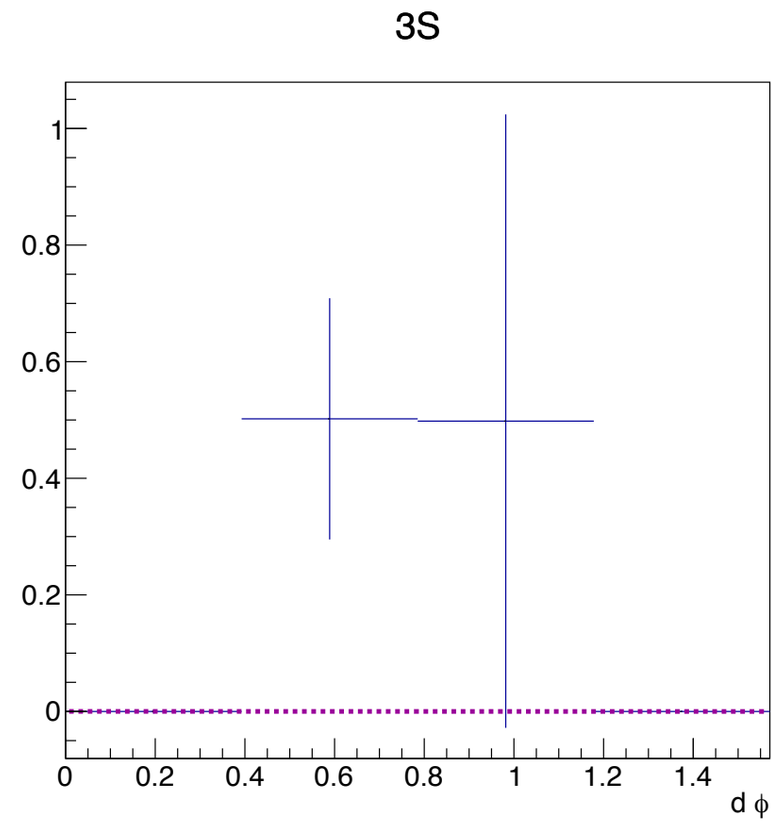
dN/dϕ(80 ≤ |Centrality| < 120)



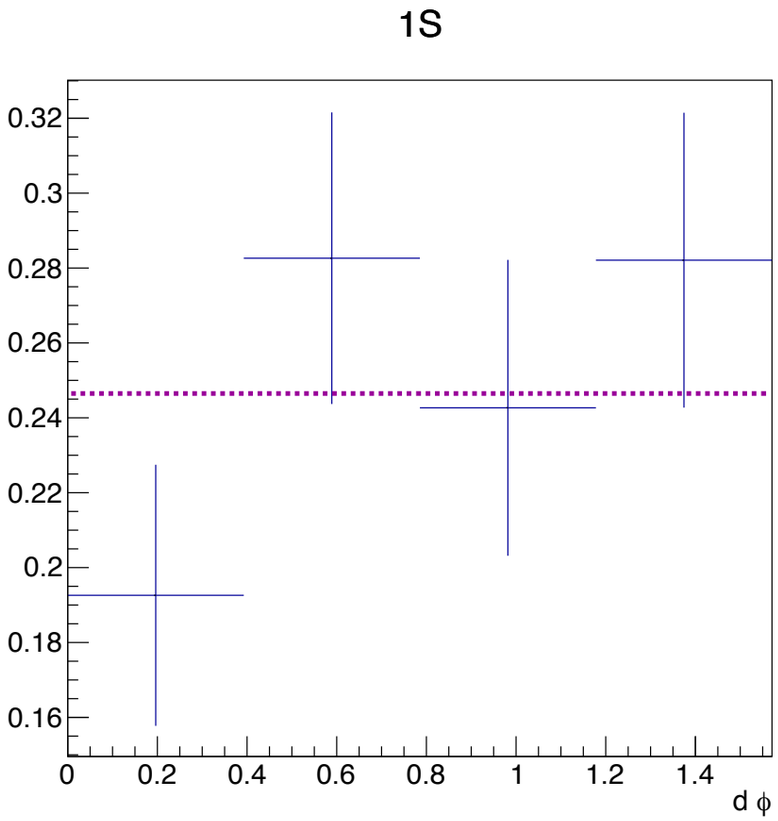
$dN/d\phi(0 \leq |p_T| < 3)$

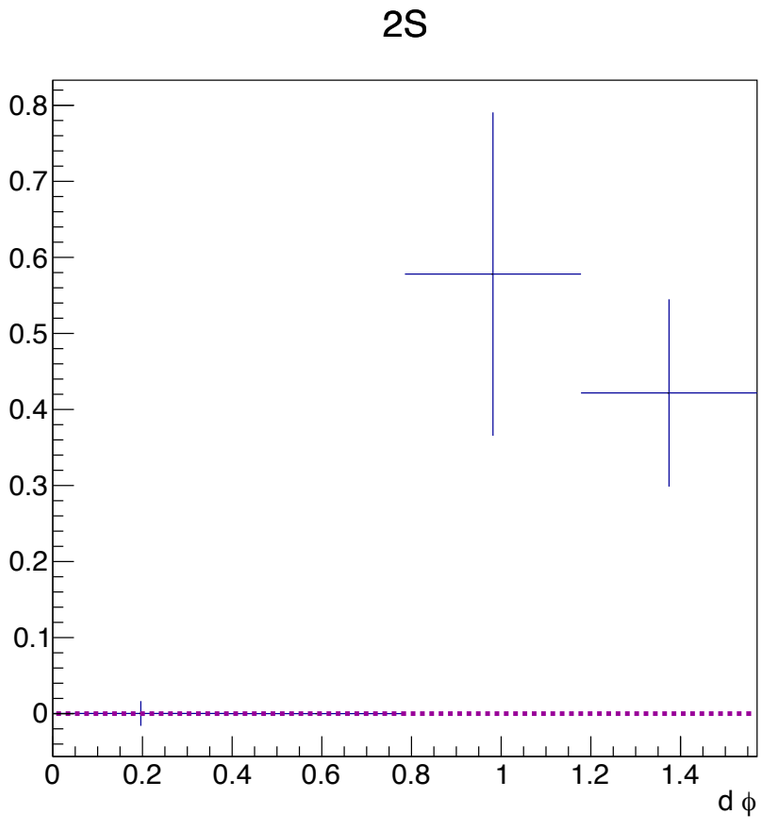


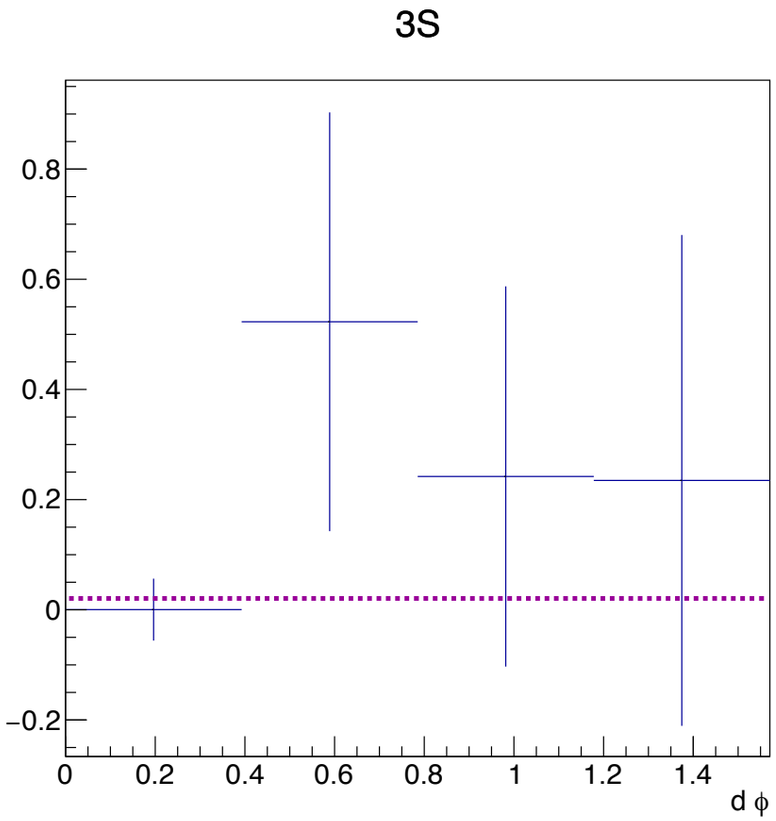




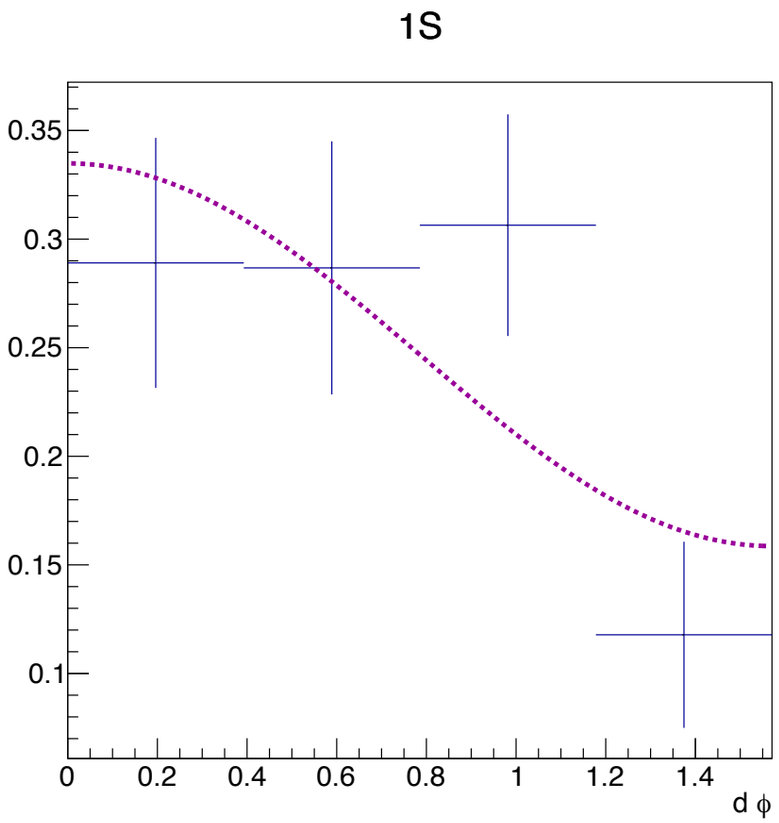
$dN/d\phi(3 \leq |p_T| < 6)$

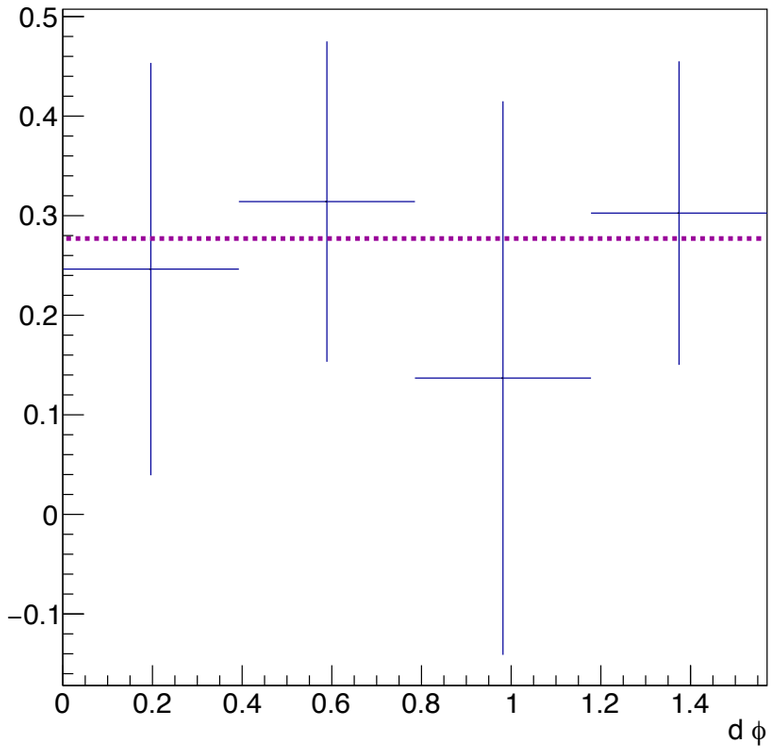


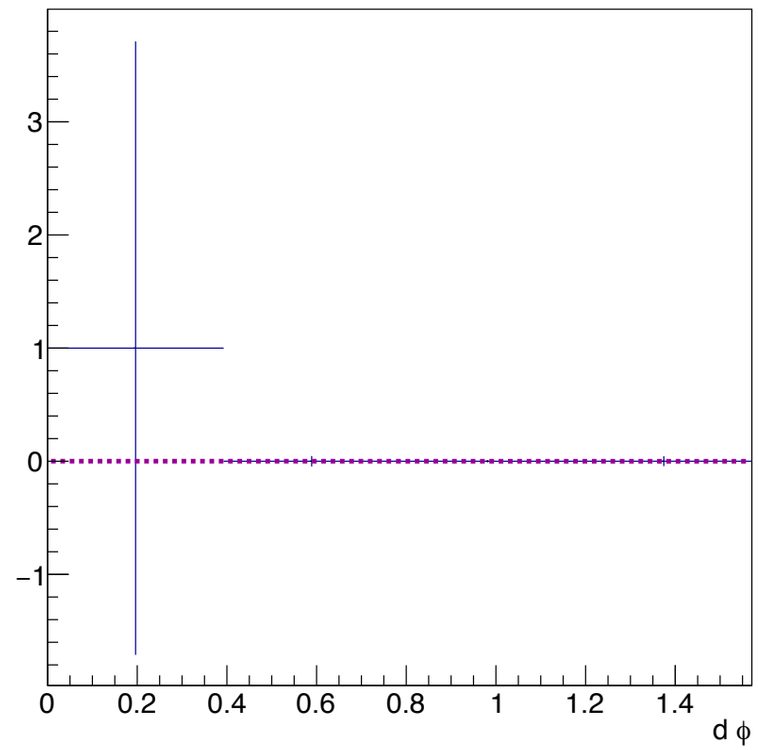
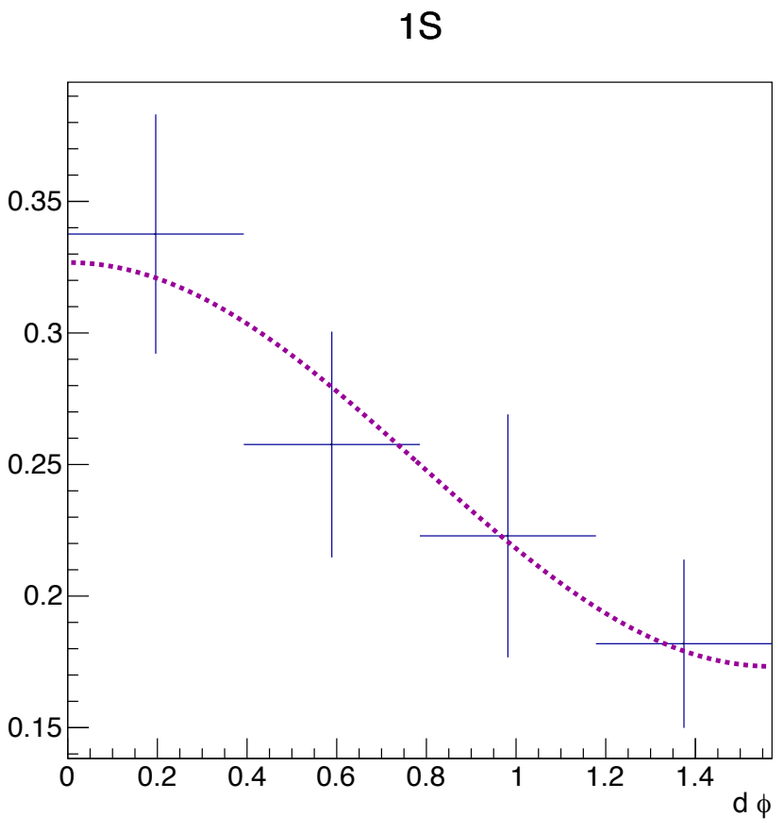
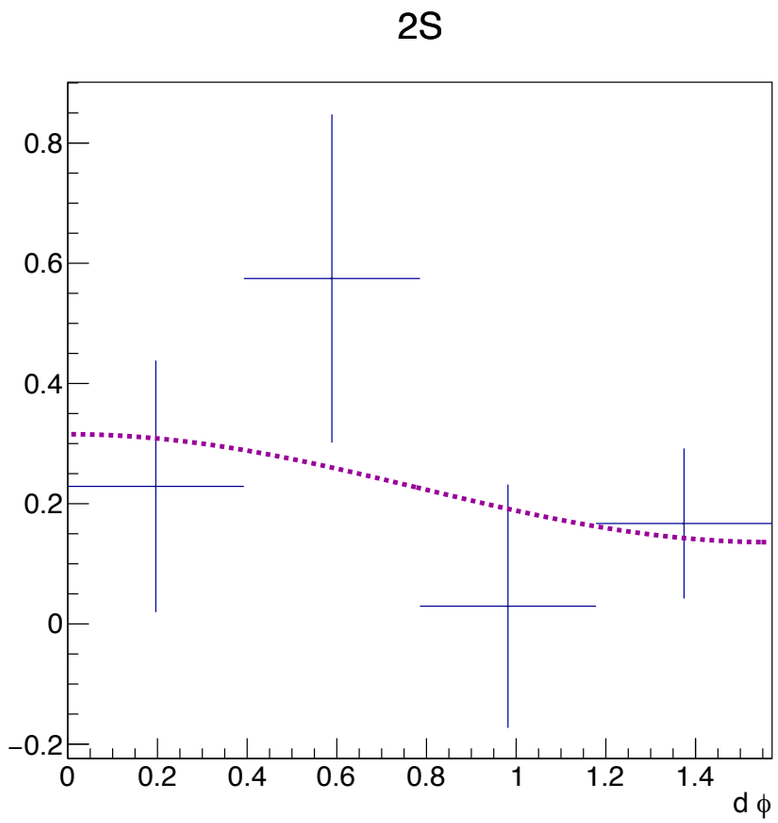
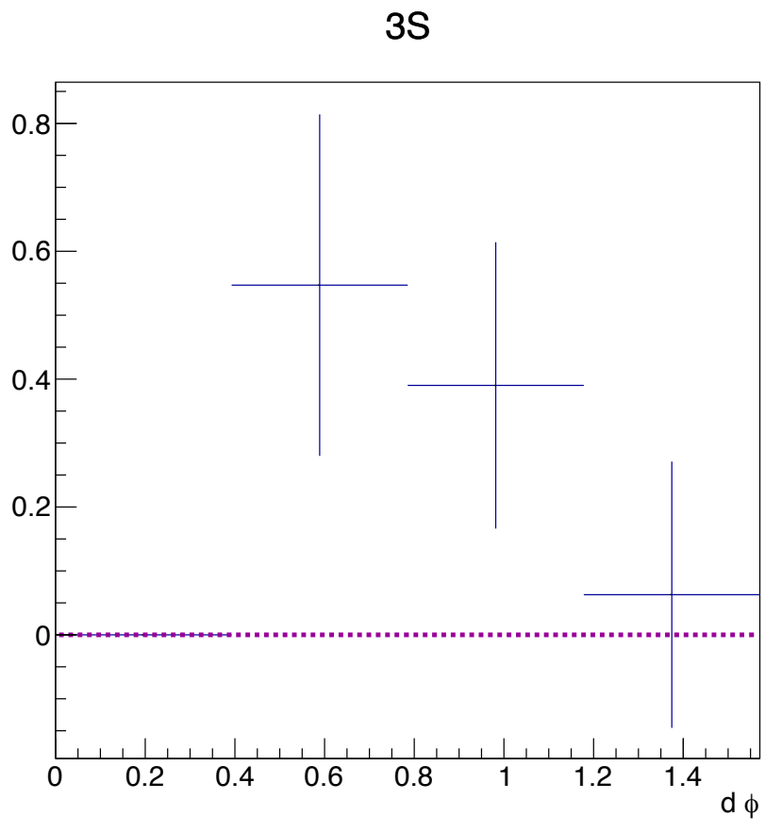




$dN/d\phi(6 \leq |p_T| < 10)$







$dN/d\phi(10 \leq |p_T| < 30)$