Control channels update

Control channel 1 (1.0 M events)

$B^+ \rightarrow$ J/Psi K^+

J/Psi $\rightarrow$ mu$^+$ mu$^-$

Control channel 2 (879285 events)

$B^+ \rightarrow$ Psi(2S) K^+

Psi(2S) $\rightarrow$ mu$^+$ mu$^-$

08 April 2024

Last meeting comments

- Plots of best sum of cosine angles for different m_hadROE ranges for both control channels.

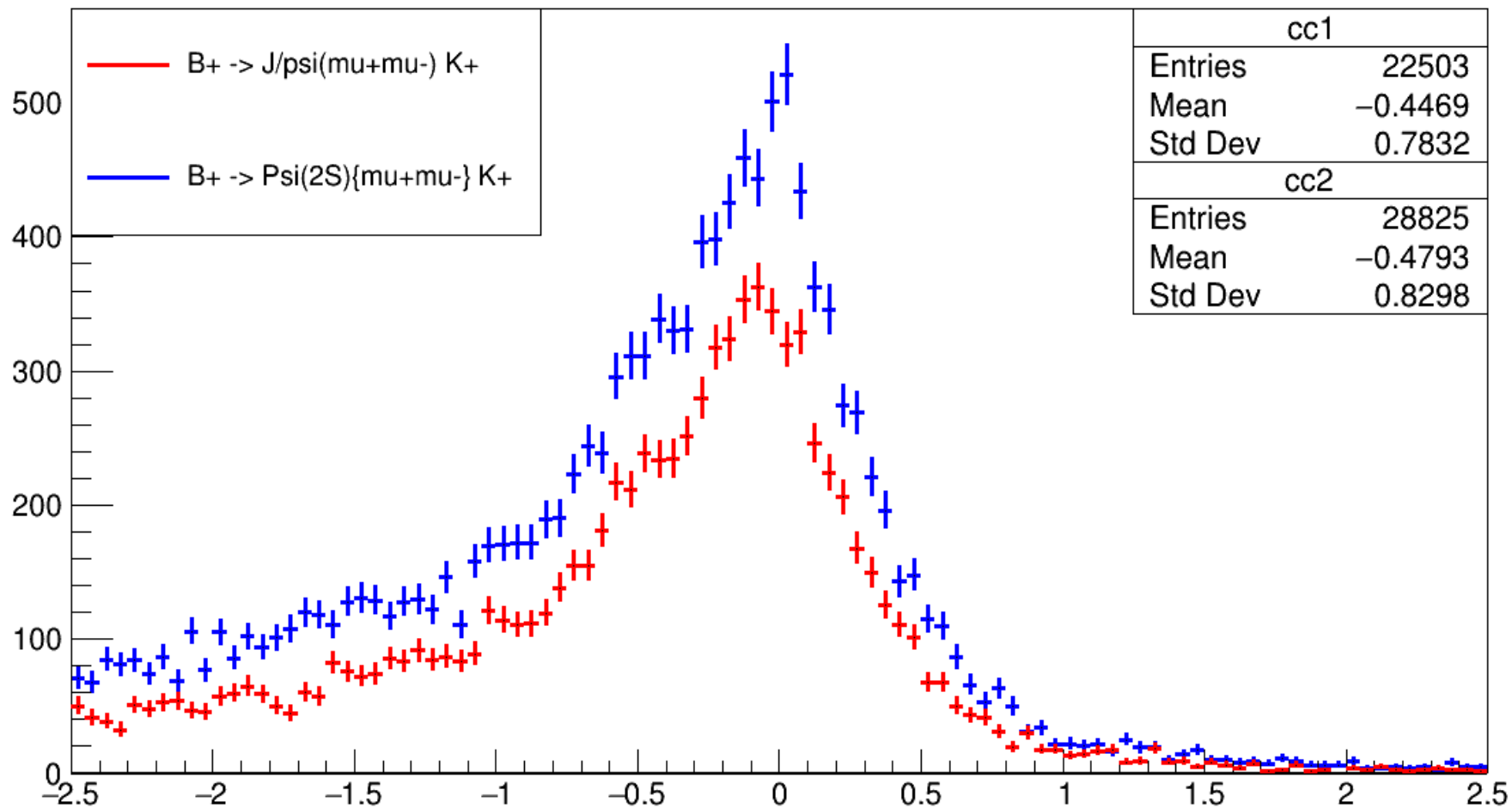- Missing mass squared distributions for second control channel. (Not done yet)

Cuts in the reconstruction program

- MVA photon cuts

- $1.3 < m_{hadROE} < 5.3$ GeV (for second control channel)
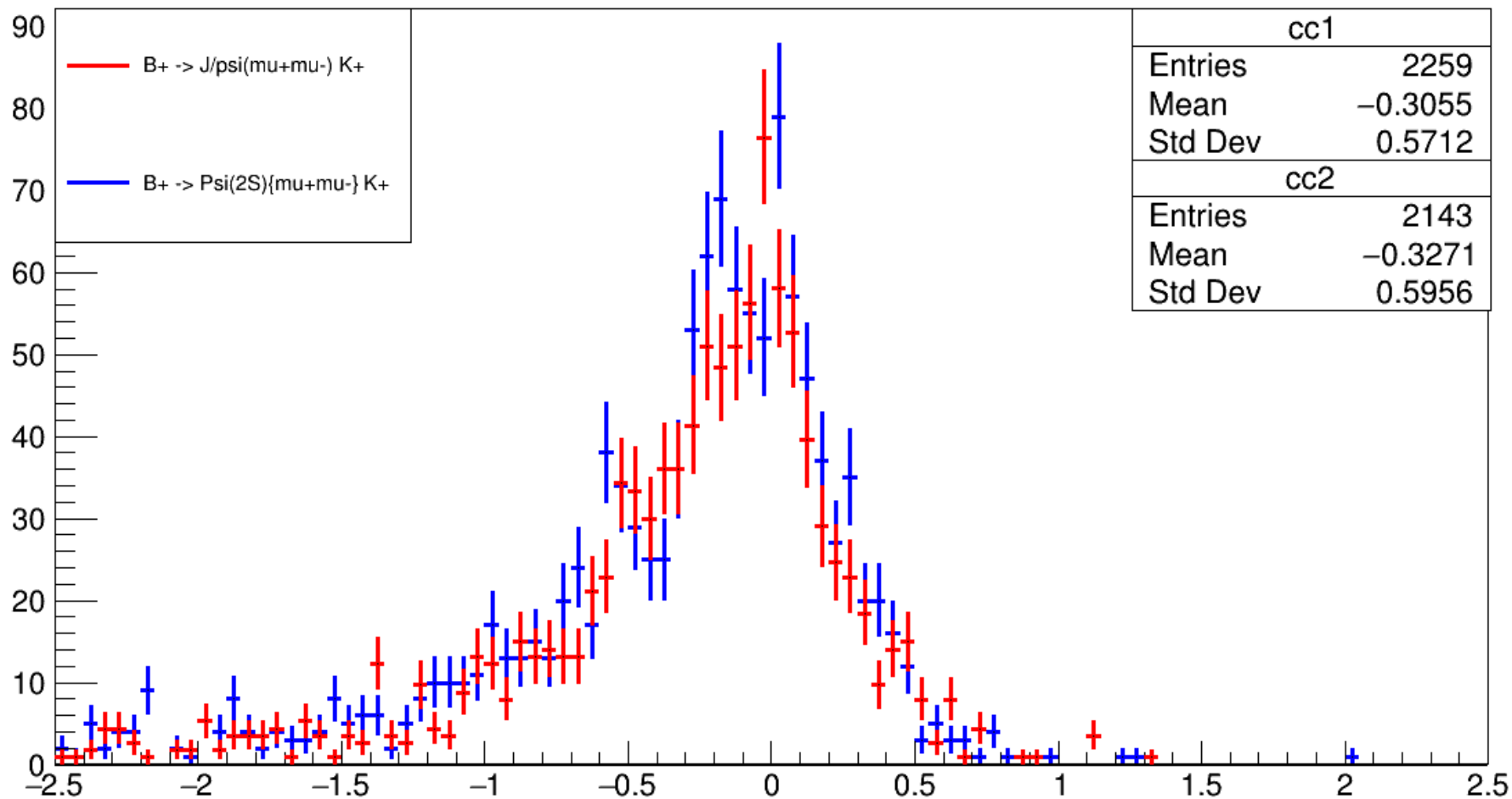
- $1.6 < m_{hadROE} < 2.4$ GeV (for first control channel)

Signal side cuts (root level)

- All applied cuts are mentioned in the title of the plots.

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cos Δθ with Mbc_Bsig>5.27,−0.050 < deltaE_Bsig < 0.050, Rank 1 and abs(sin_phi)<1.1

B+ -> J/psi(mu+mu-) K+

B+ -> Psi(2S){mu+mu-} K+

cc1	
Entries	22503
Mean	−0.4469
Std Dev	0.7832
cc2	
Entries	28825
Mean	−0.4793
Std Dev	0.8298

cosΔθ with Mbc_Bsig>5.27,-0.050 < deltaE_Bsig < 0.050, Rank 1, abs(sin_phi)<1.1 and abs(m_hadROE-1.86)<0.015

B+ -> J/psi(mu+mu-) K+

B+ -> Psi(2S){mu+mu-} K+

cc1	
Entries	2259
Mean	−0.3055
Std Dev	0.5712
cc2	
Entries	2143
Mean	−0.3271
Std Dev	0.5956

cosΔθ with Mbc_Bsig>5.27,-0.050 < deltaE_Bsig < 0.050, Rank 1, abs(sin_phi)<1.1 and abs(m_hadROE-2.006)<0.030
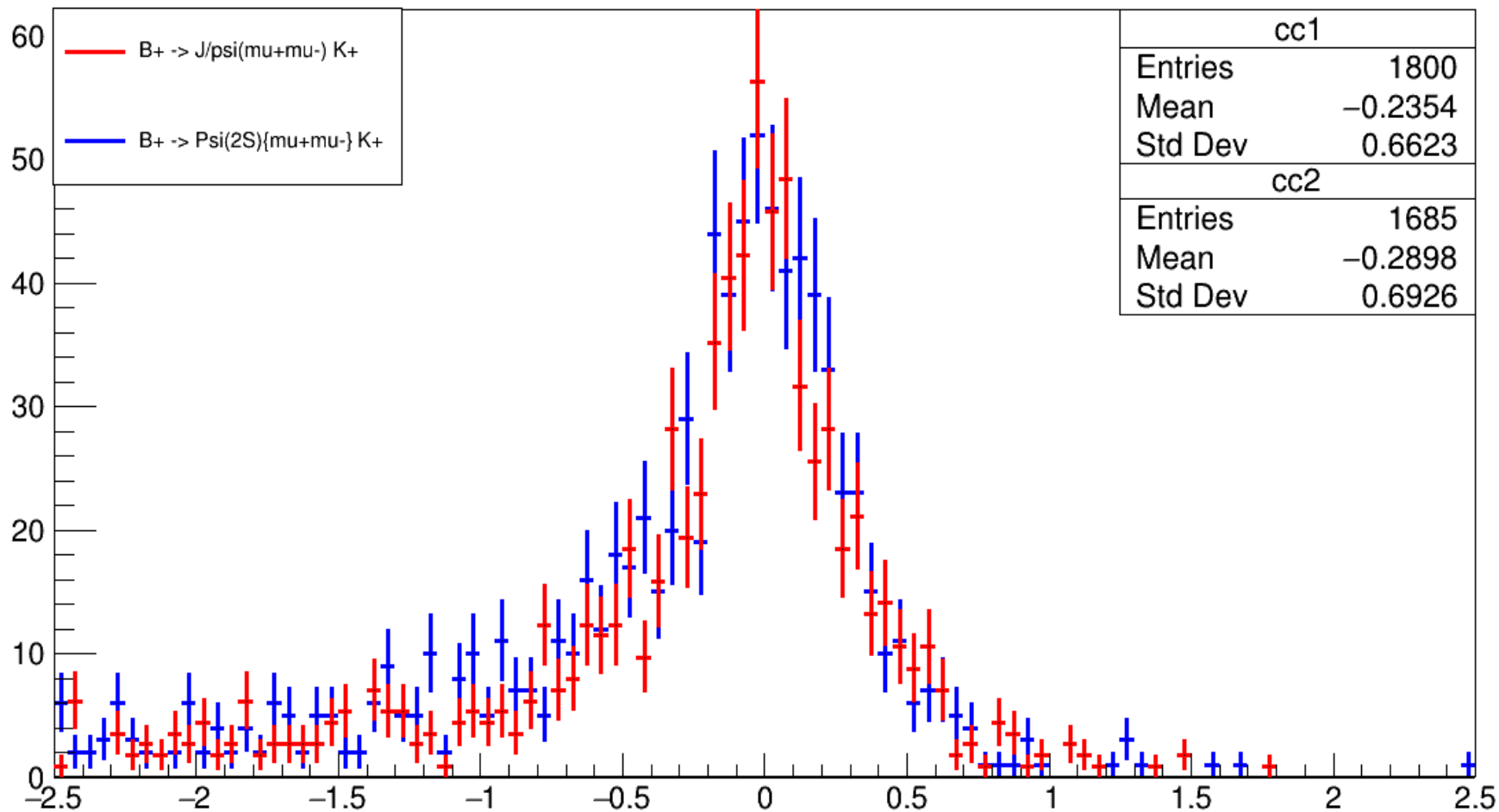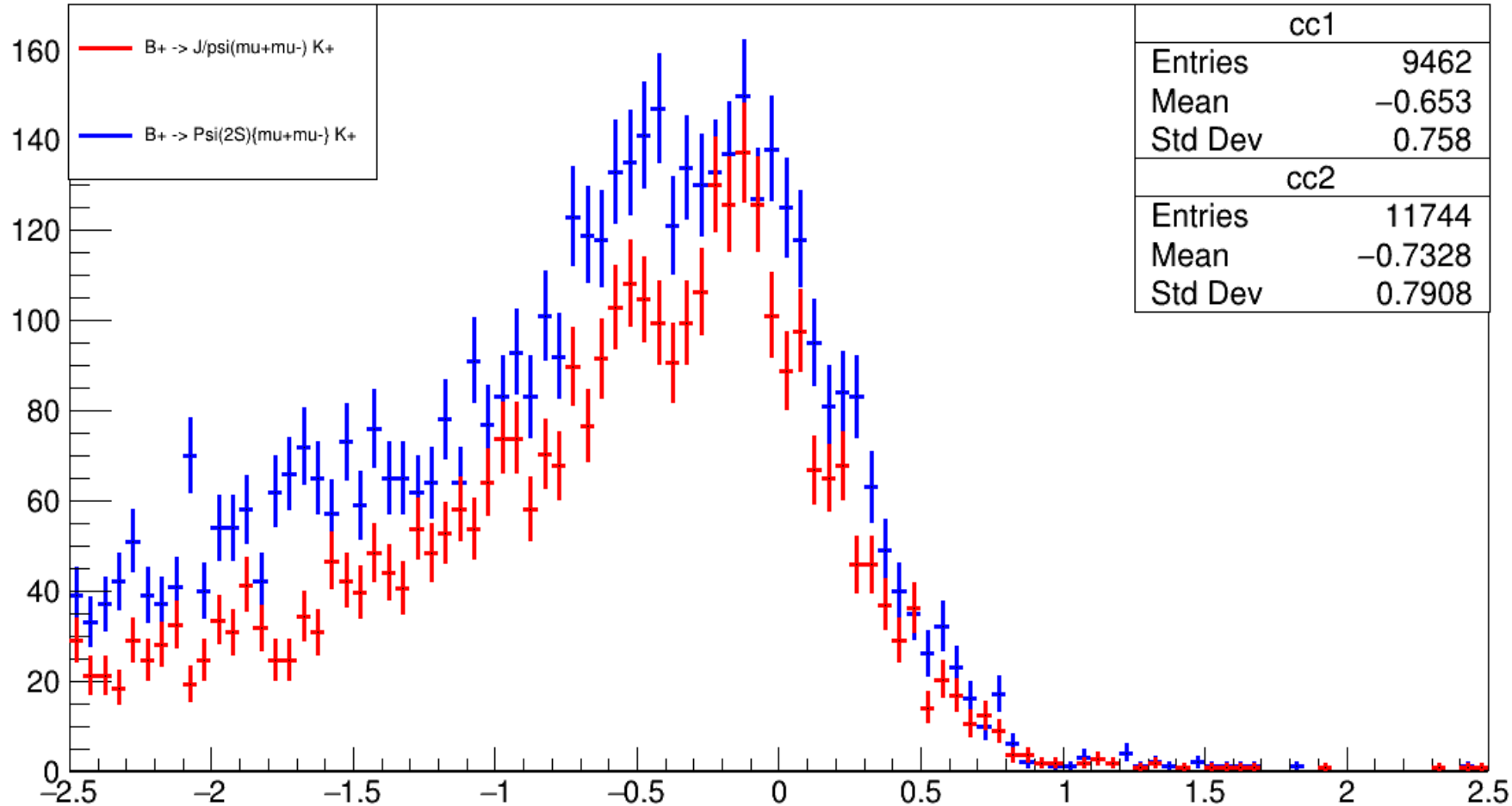
Legend:
- B+ -> J/psi(mu+mu-) K+
- B+ -> Psi(2S){mu+mu-} K+

cc1	
Entries	1800
Mean	−0.2354
Std Dev	0.6623

cc2	
Entries	1685
Mean	−0.2898
Std Dev	0.6926

cosΔθ with Mbc_Bsig>5.27,-0.050 < deltaE_Bsig < 0.050, Rank 1, abs(sin_phi)<1.1 and abs(m_hadROE-1.96)<0.030

Legend:
- B+ -> J/psi(mu+mu-) K+
- B+ -> Psi(2S){mu+mu-} K+

	cc1	
Entries		9462
Mean		−0.653
Std Dev		0.758

	cc2	
Entries		11744
Mean		−0.7328
Std Dev		0.7908

cosΔθ with Mbc_Bsig>5.27,-0.050 < deltaE_Bsig < 0.050, Rank 1, abs(sin_phi)<1.1 and m_hadROE < 1.86

B+ -> J/psi(mu+mu-) K+

B+ -> Psi(2S){mu+mu-} K+

cc1	
Entries	9462
Mean	−0.653
Std Dev	0.758

cc2	
Entries	11744
Mean	−0.7328
Std Dev	0.7908

cosΔθ with Mbc_Bsig>5.27,-0.050 < deltaE_Bsig < 0.050, Rank 1, abs(sin_phi)<1.1 and m_hadROE > 2.006

B+ -> J/psi(mu+mu-) K+

B+ -> Psi(2S){mu+mu-} K+

	cc1	
Entries		7200
Mean		−0.2894
Std Dev		0.8845
	cc2	
Entries		11735
Mean		−0.3066
Std Dev		0.8827
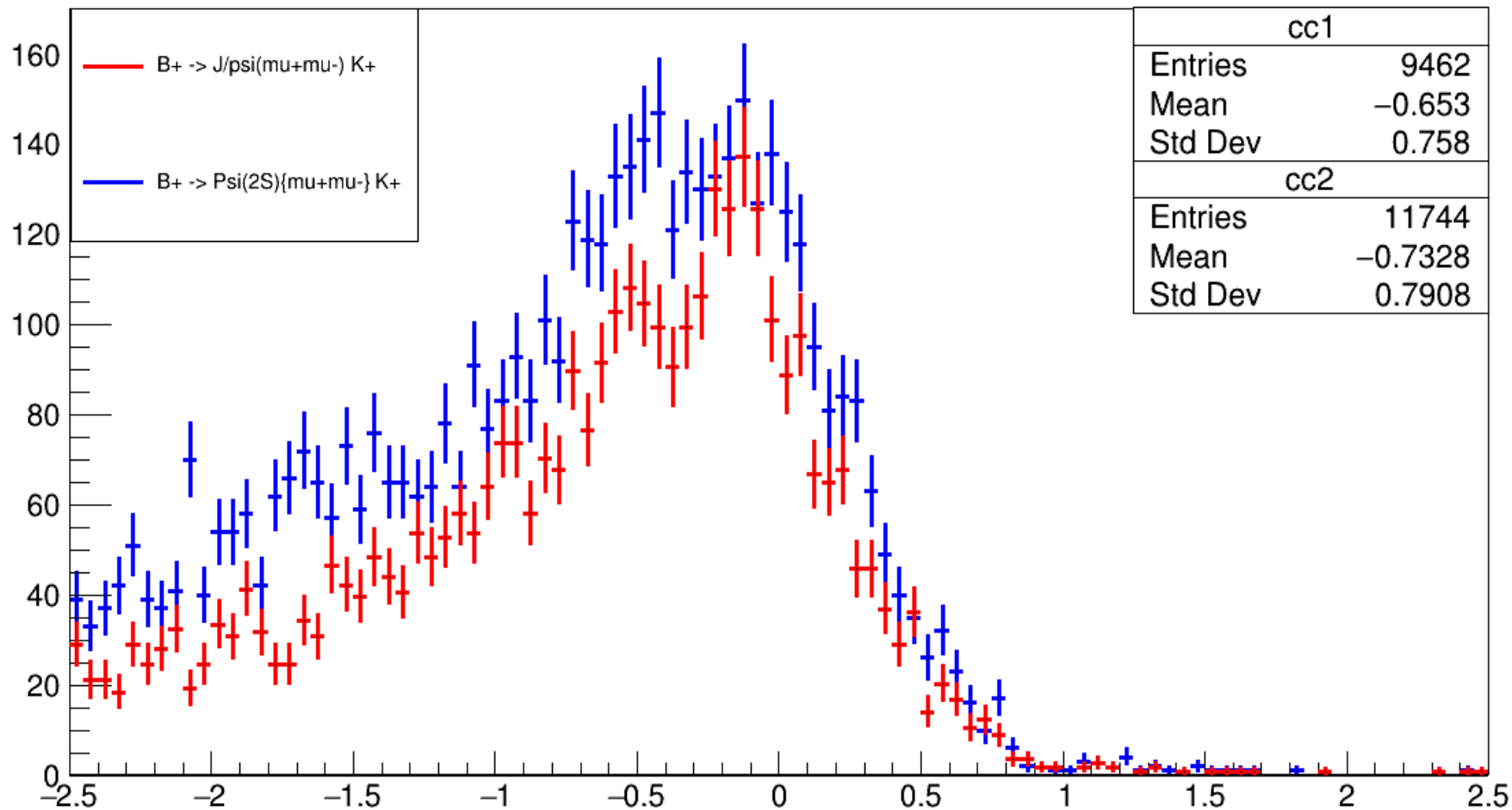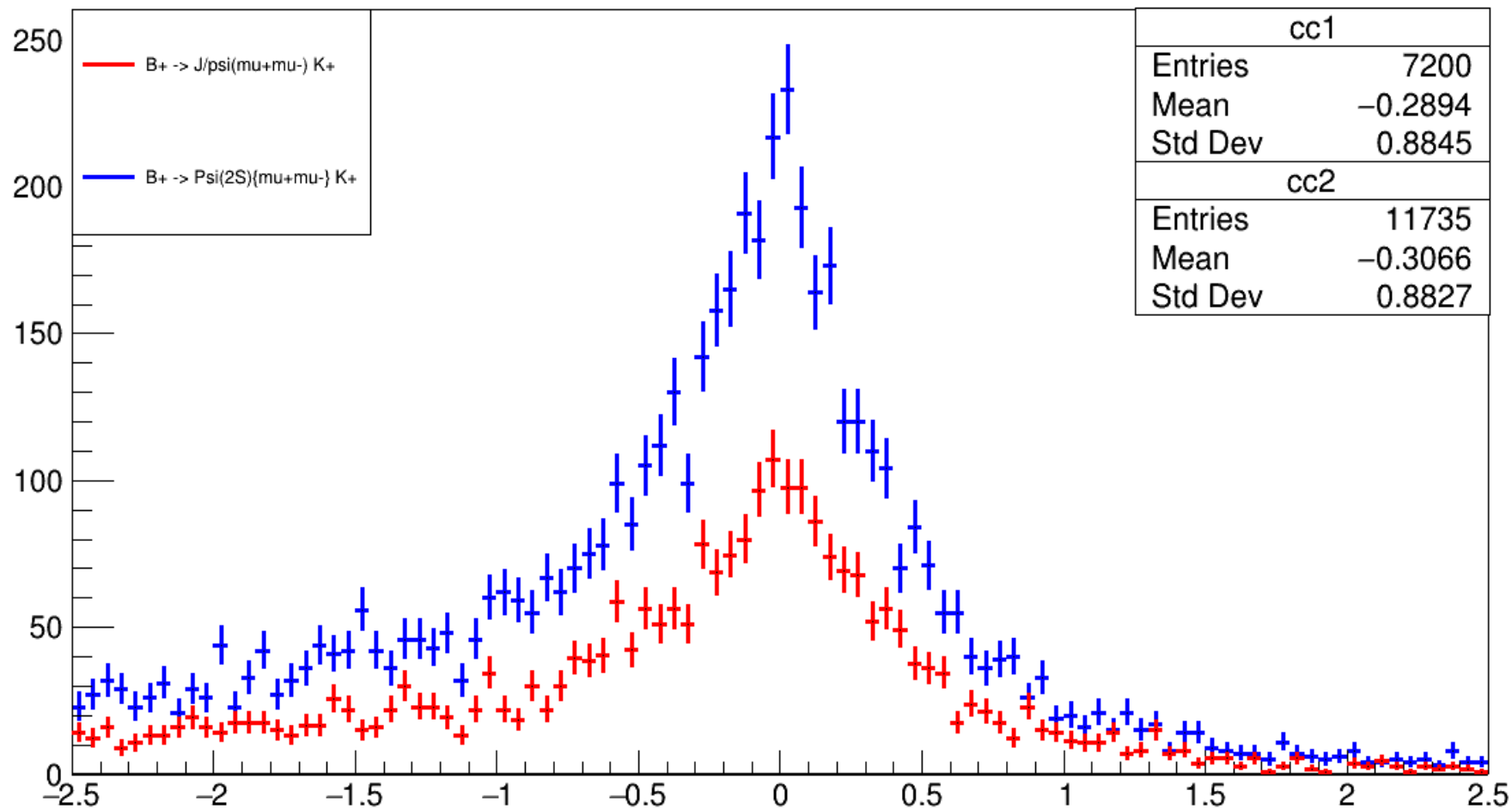
Back up

m_hadROE with Mbc_Bsig>5.27,-0.050 < deltaE_Bsig < 0.050,abs(sin_phi)<1 and Rank 1

Legend:
- B+ -> J/psi(mu+mu-) K+ (red)
- B+ -> Psi(2S){mu+mu-} K+ (blue)

cc2	
Entries	18594
Mean	1.898
Std Dev	0.2428

cc1	
Entries	13871
Mean	1.926
Std Dev	0.2086