

# Control channels summary

All modes are normalized to 879,285 events

07 May 2024

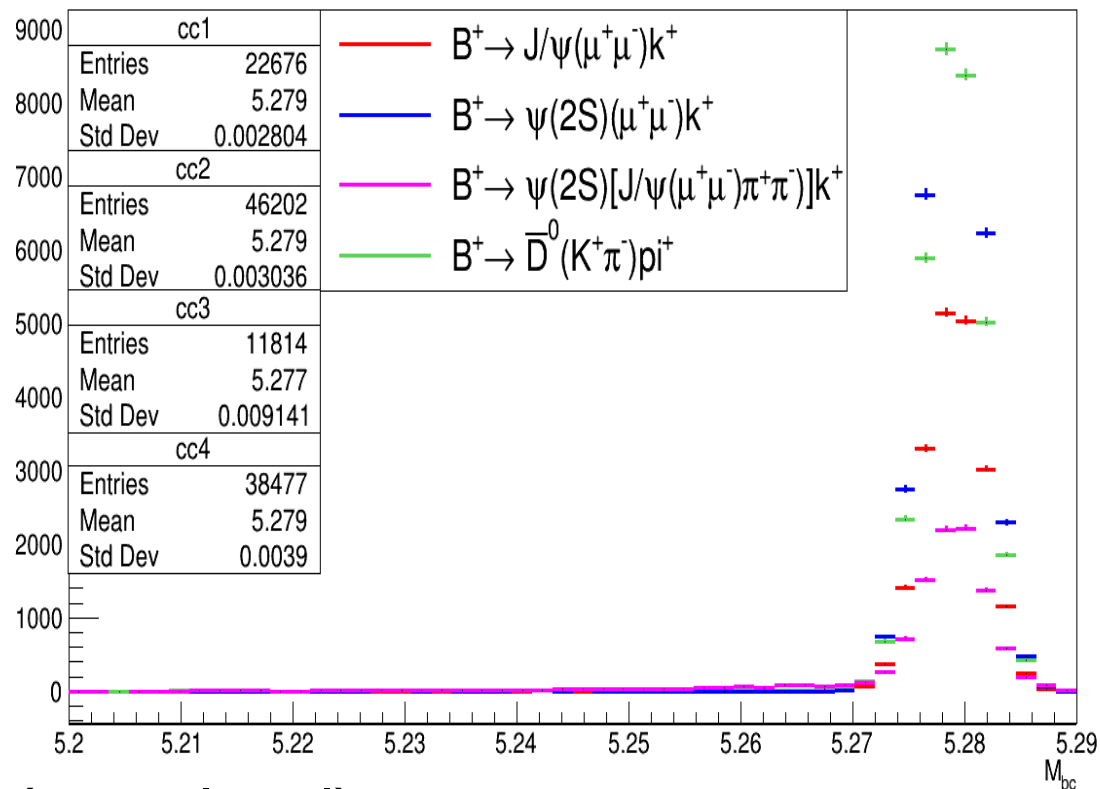
# Modes

$B^+ \rightarrow J/\Psi K^+$	$1.02 \times 10^{-3}$
$J/\Psi \rightarrow \mu^+ \mu^-$	5.973%
$B^+ \rightarrow \Psi(2S) K^+$	$6.24 \times 10^{-4}$
$\Psi(2S) \rightarrow \mu^+ \mu^-$	$8 \times 10^{-3}$
$B^+ \rightarrow \Psi(2S) K^+$	$6.24 \times 10^{-4}$
$\Psi(2S) \rightarrow J/\Psi \pi^+ \pi^-$	34 %
$B^+ \rightarrow \bar{D}^0 \pi^+$	$4.61 \times 10^{-3}$
$\bar{D}^0 \rightarrow K^+ \pi^-$	3.947 %

# $M_{bc}$

## *Cuts applied*

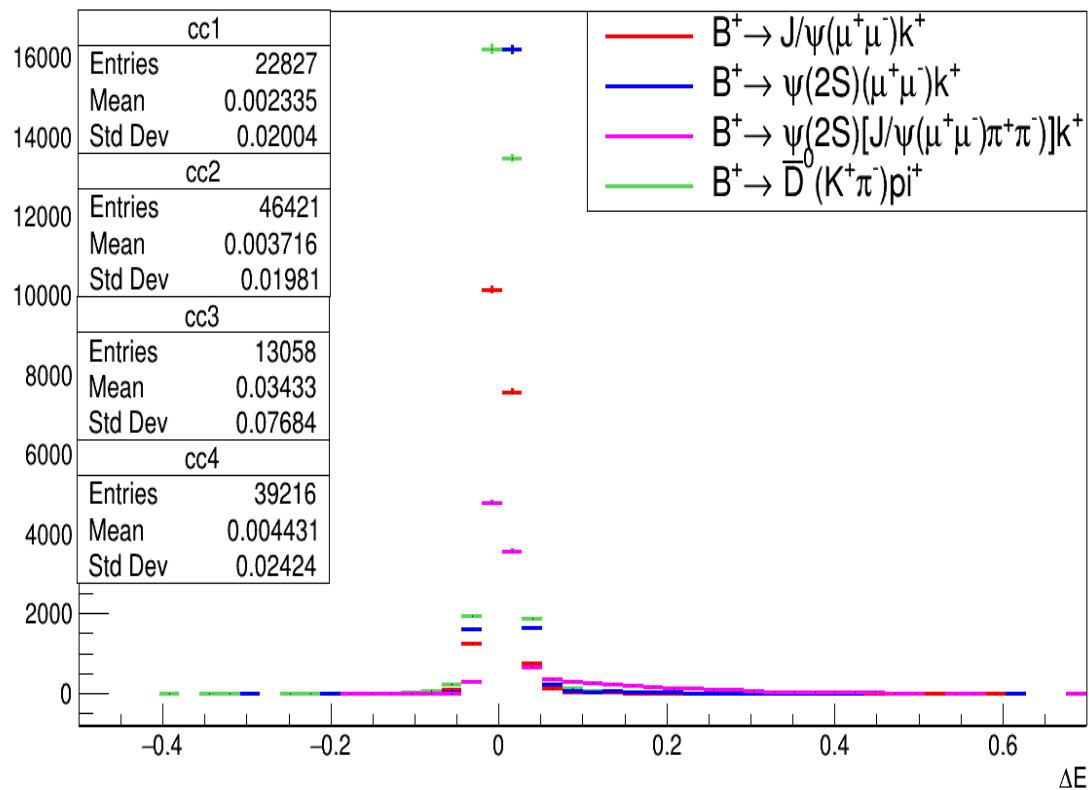
- Rank 1
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



# $\Delta E$

## *Cuts applied*

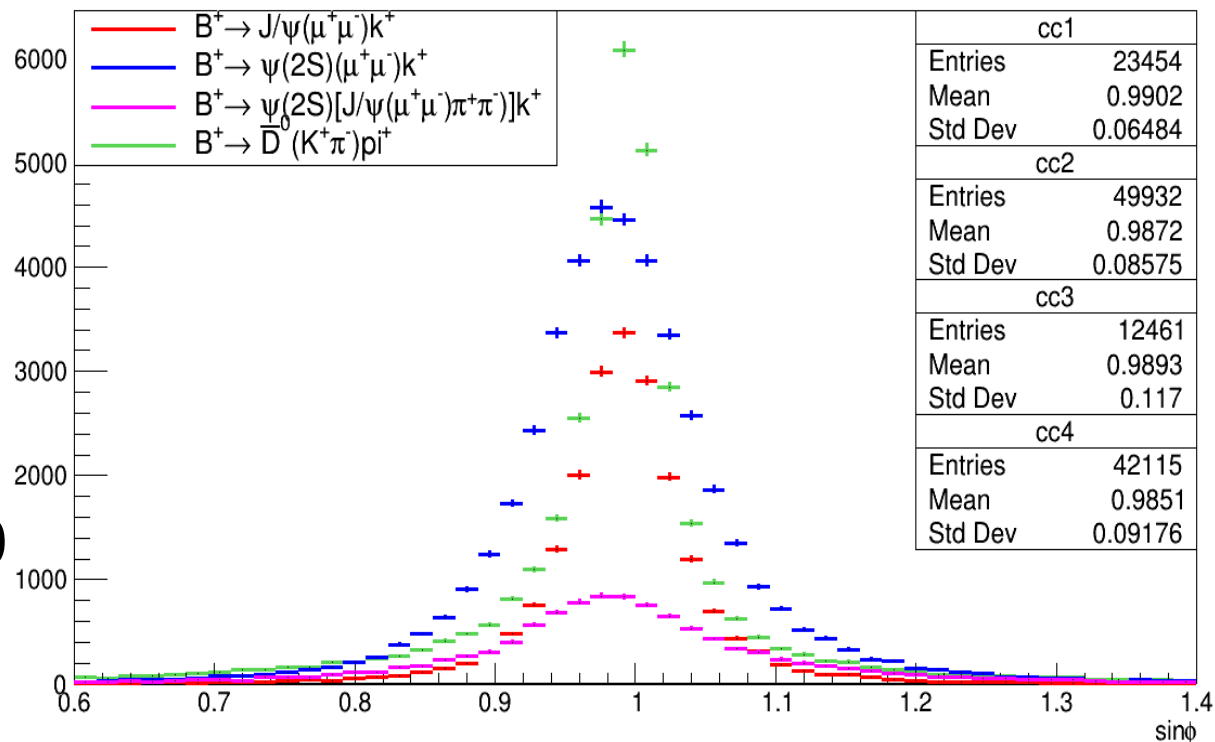
- Rank 1
- $M_{bc} > 5.27$
- $\text{abs}(\sin\_phi) < 1.1$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



# Sin\_phi

## Cuts applied

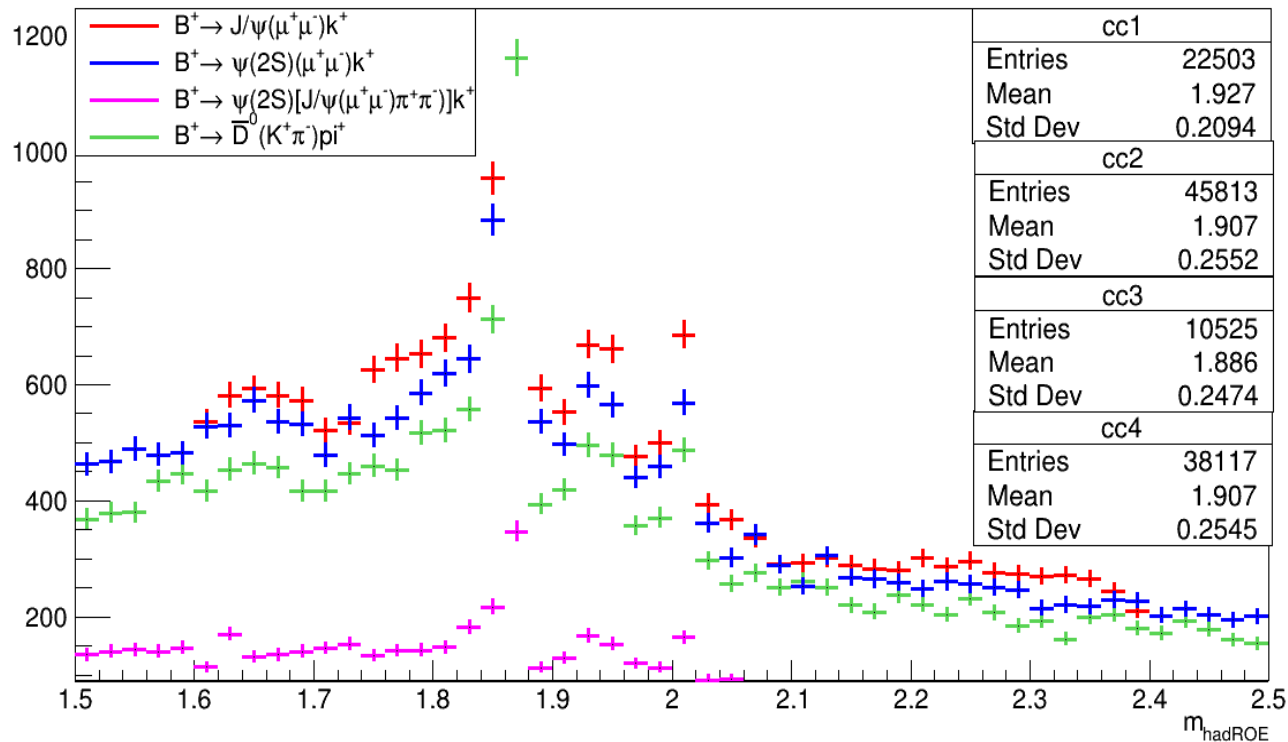
- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



# m\_hadROE

## Cuts applied

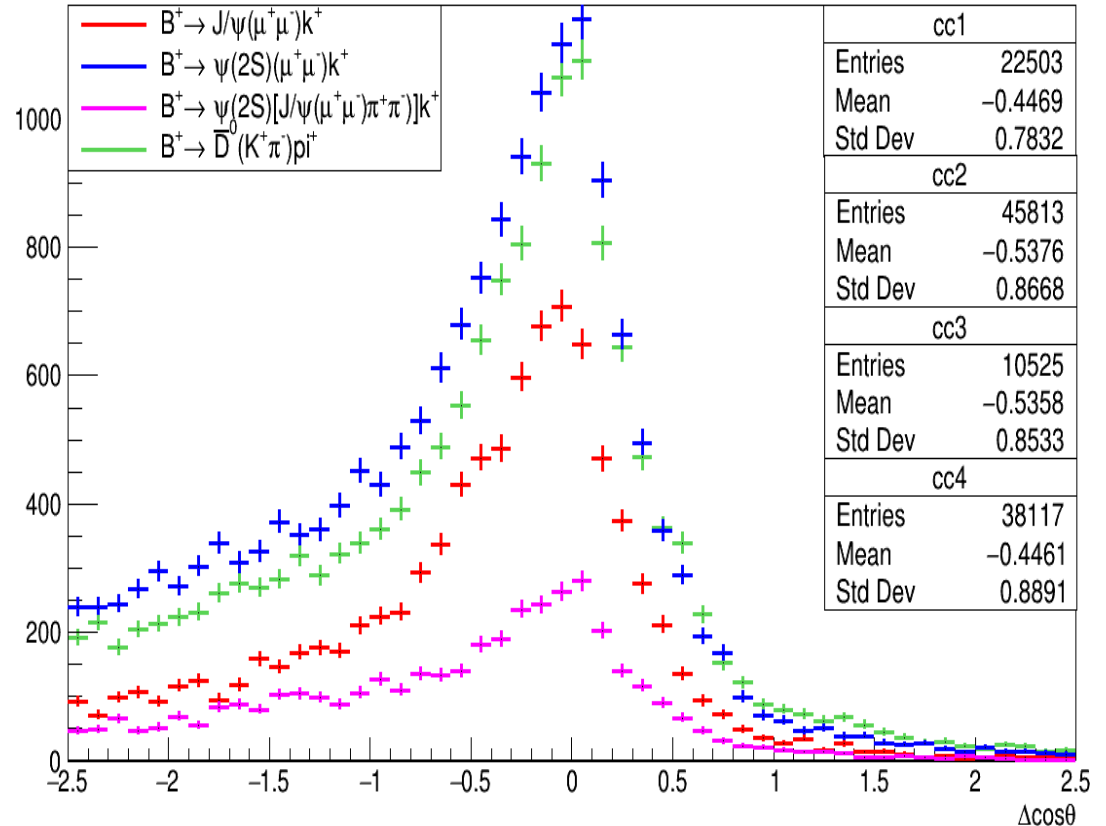
- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV}$  (reco. level)



# Best sum of cosine angles

## *Cuts applied*

- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



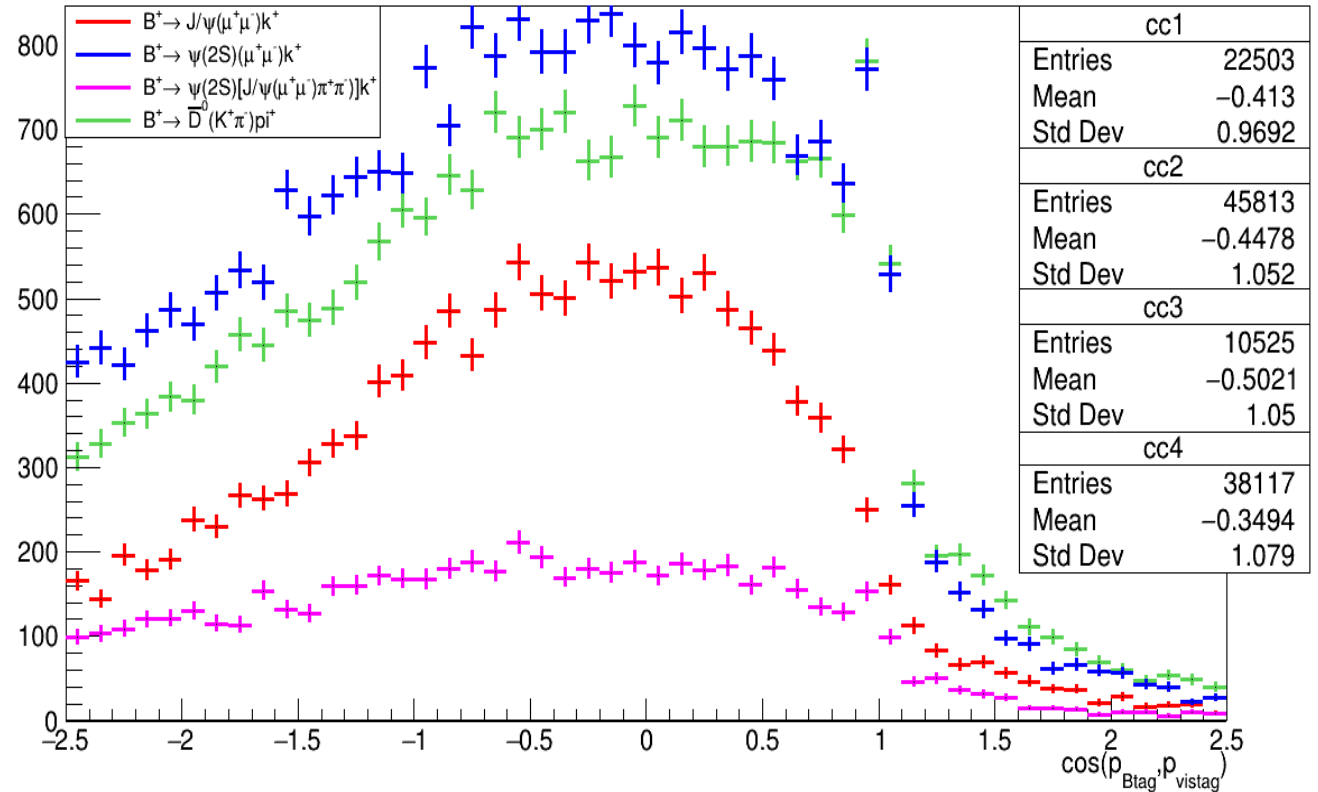
Back up



# $\cos(\rho_{\text{Btag}}, \rho_{\text{vistag}})$

## Cuts applied

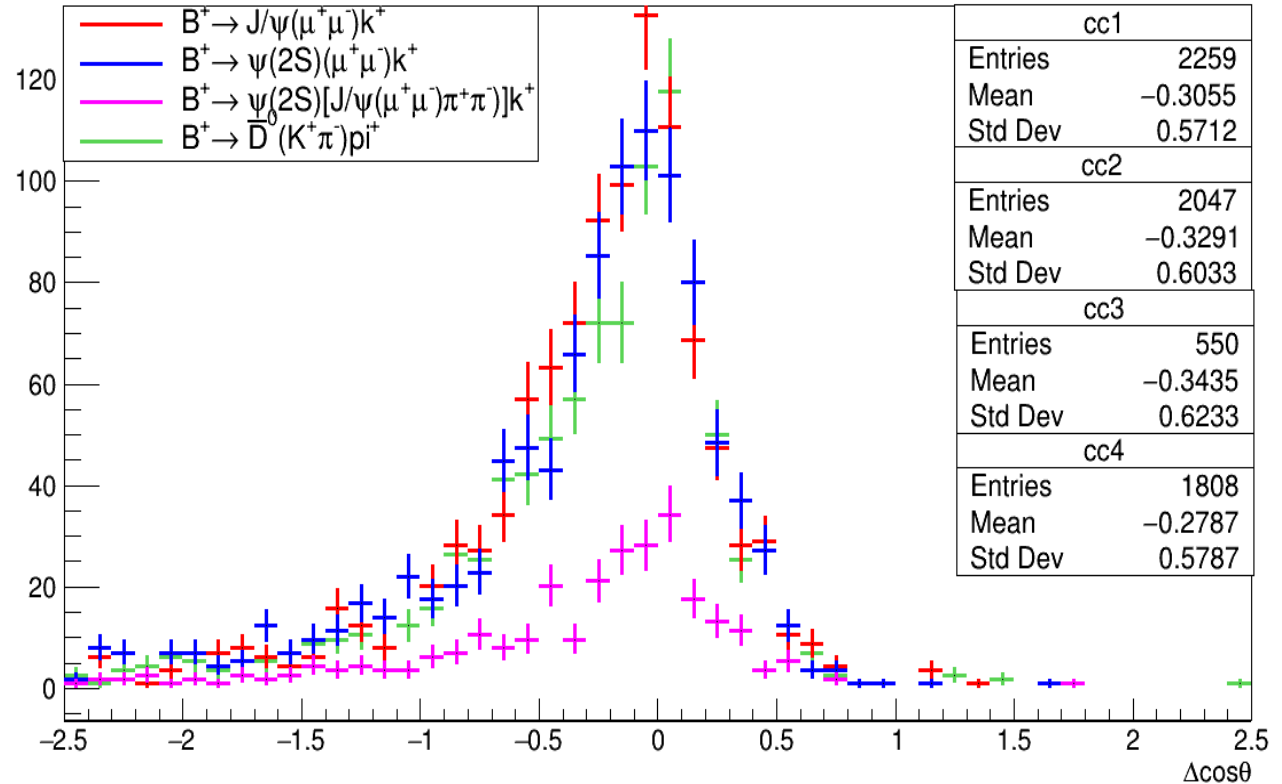
- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



# Best sum around D0

## Cuts applied

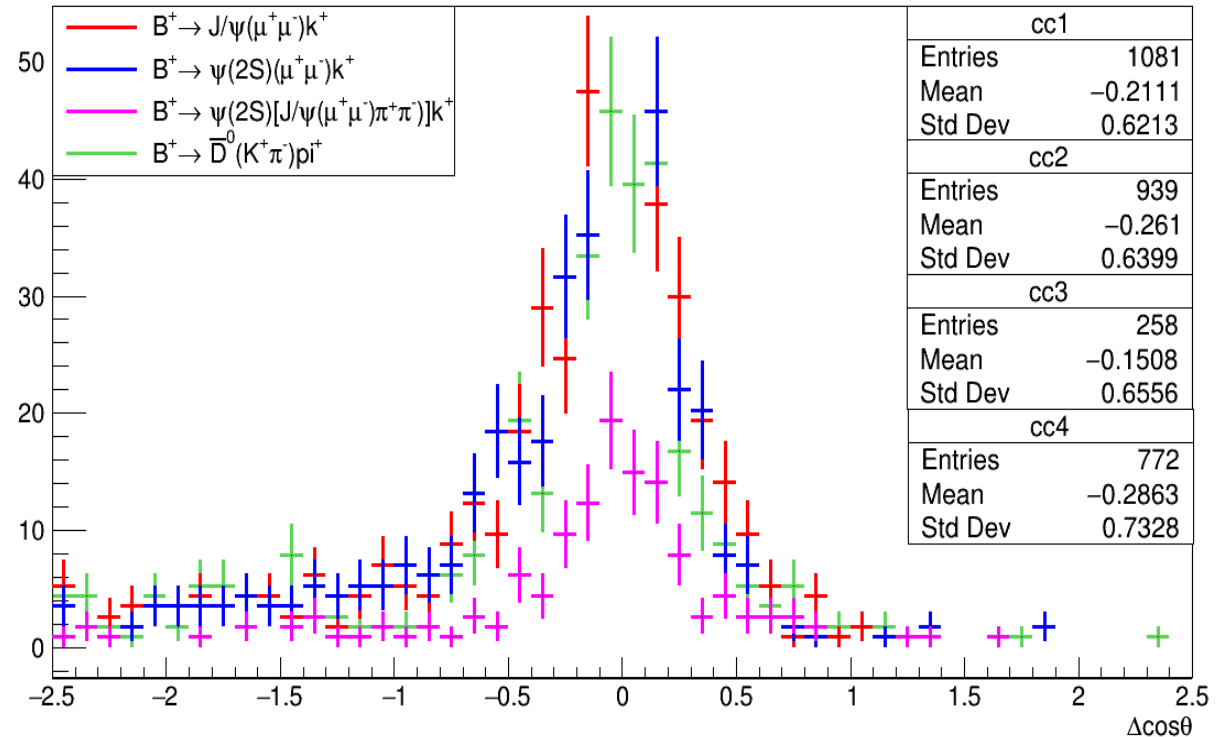
- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $\text{abs}(m_{\text{hadROE}} - 1.86) < 0.015$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



# Best sum around D\*

## Cuts applied

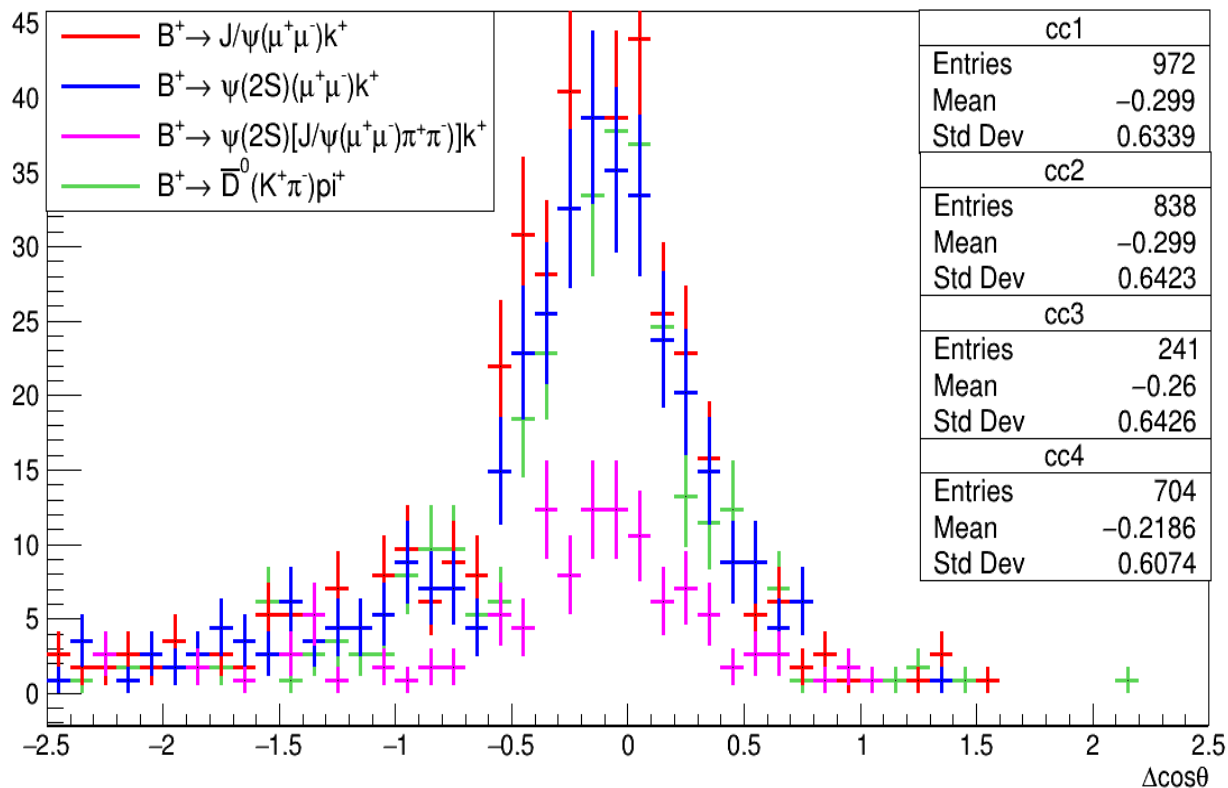
- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $\text{abs}(m_{\text{hadROE}} - 2.006) < 0.015$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



# Best sum b/w D and D\*

## Cuts applied

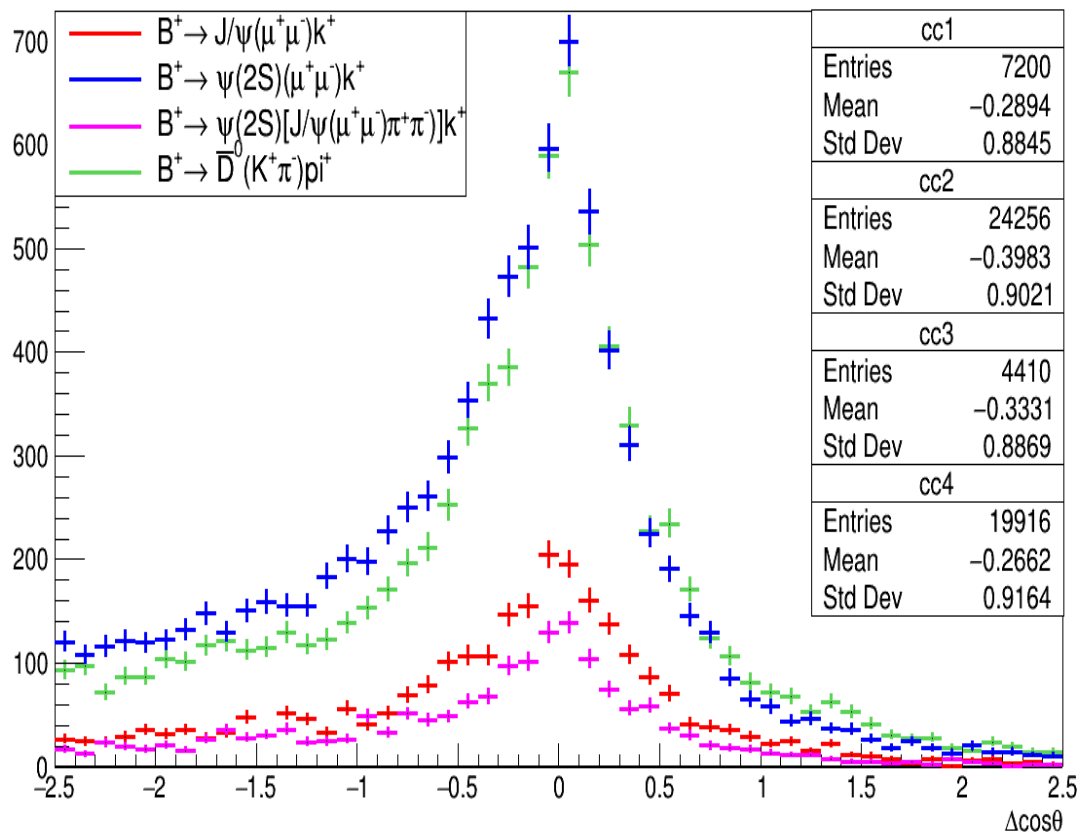
- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $\text{abs}(m_{\text{hadROE}} - 1.96) < 0.015$
- $1.3 < m_{\text{hadROE}} < 5.3$  GeV (reco. level)



# Best sum greater than D\*

## Cuts applied

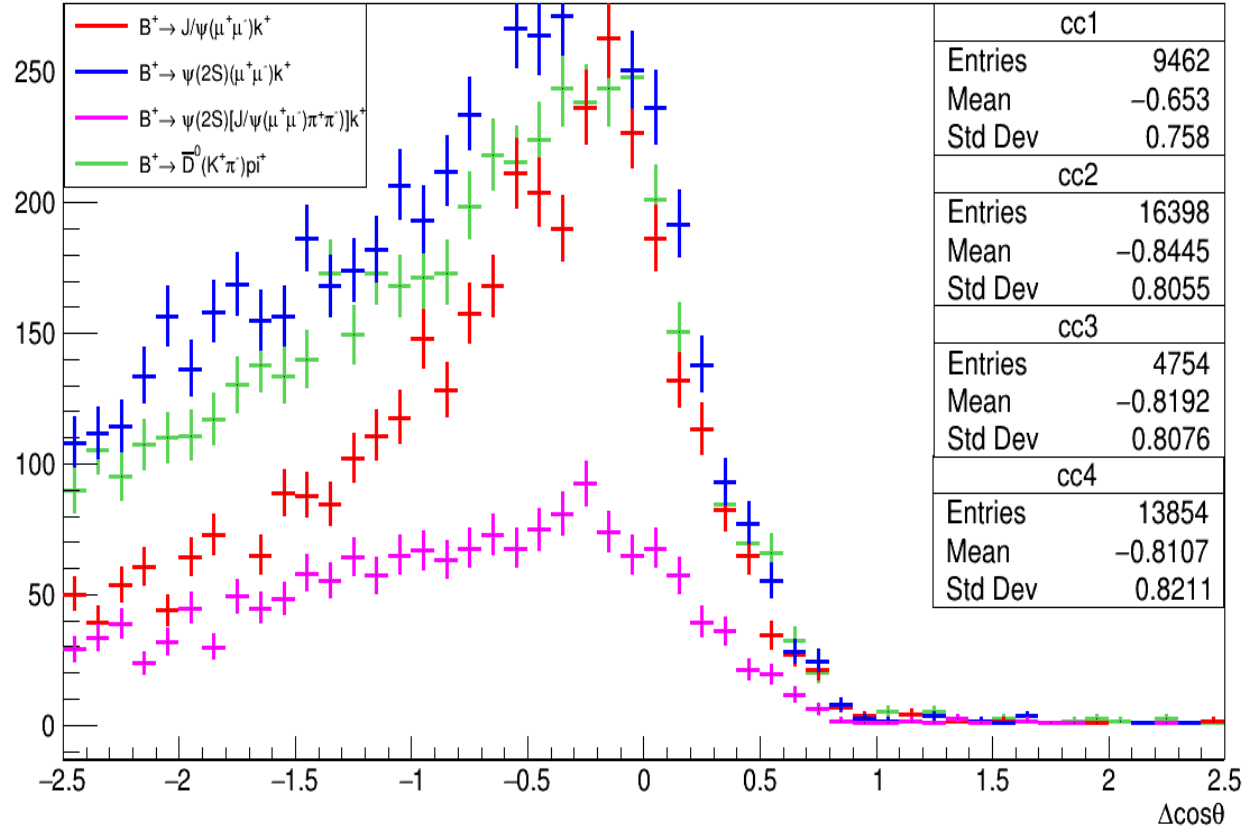
- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $M_{\text{hadROE}} > 2.006$
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV (reco. level)}$



# Best sum less than D0

## Cuts applied

- Rank 1
- $M_{bc} > 5.27$
- $-0.050 < \Delta E < 0.050$
- $\text{abs}(\sin\_phi) < 1.1$
- $M_{\text{hadROE}} < 1.86$
- $1.3 < m_{\text{hadROE}} < 5.3$  GeV (reco. level)



# Proposed cuts for the generic MC

- Rank 1
- $\text{abs}(\cos(P_{\text{Btag}}, P_{\text{vistag}})) < 1.2$
- $1.83 < m_{D0} < 1.89$
- $\text{abs}(\sin\_phi) < 1.1$
- $1.7 < M_{\text{hadROE}} < 2.2$
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