

Third control channel

1.0 M dedicated signal MC

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

$\text{Psi}(2S) \rightarrow J/\text{Psi} \pi^+ \pi^-$

$J/\text{Psi} \rightarrow \mu^+ \mu^-$

$B^- \rightarrow \text{generic}$

24 April 2024

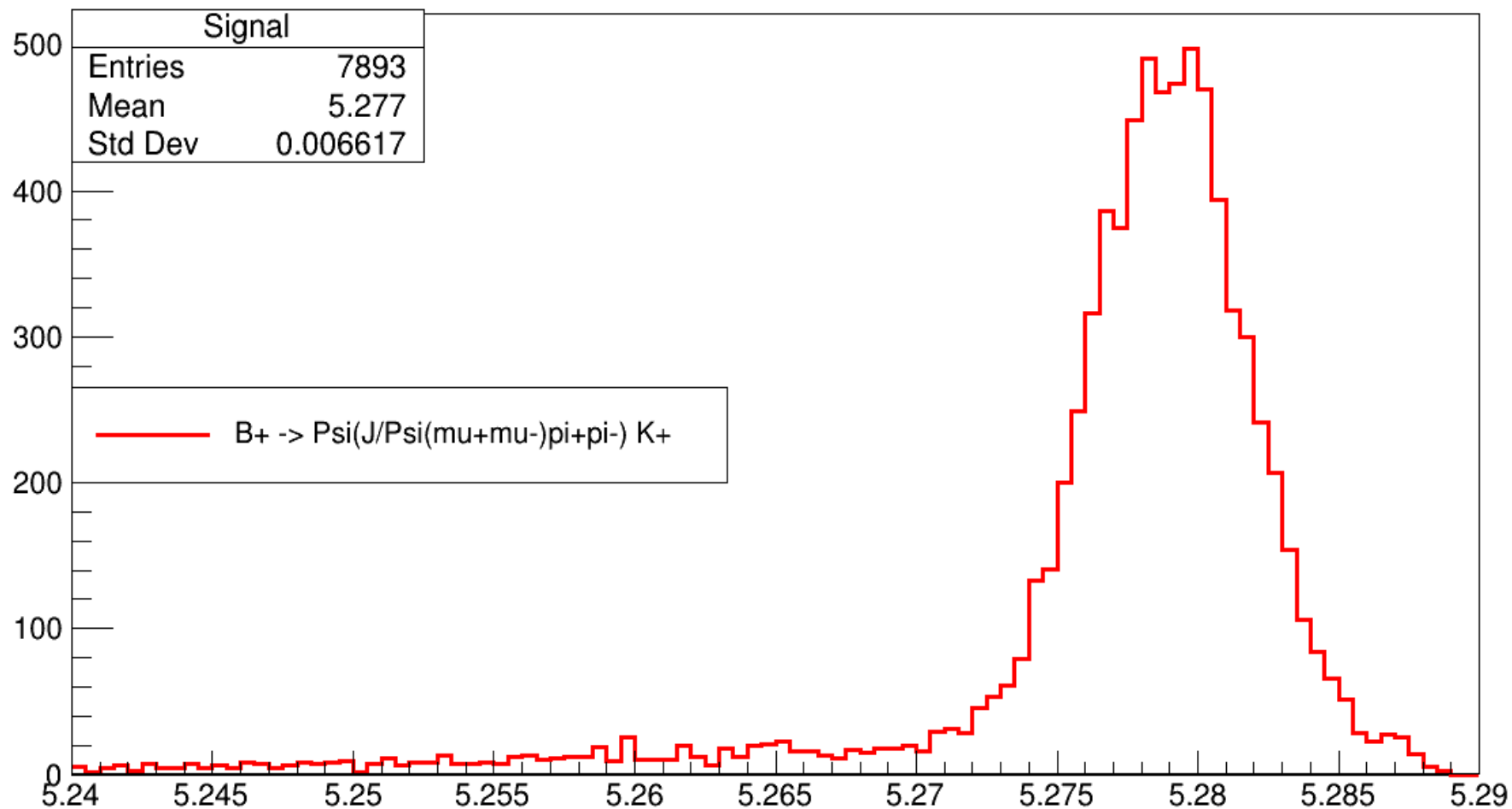
Cuts in the reconstruction program

- MVA photon cuts.
- $1.3 < m_{\text{hadROE}} < 5.3 \text{ GeV}$

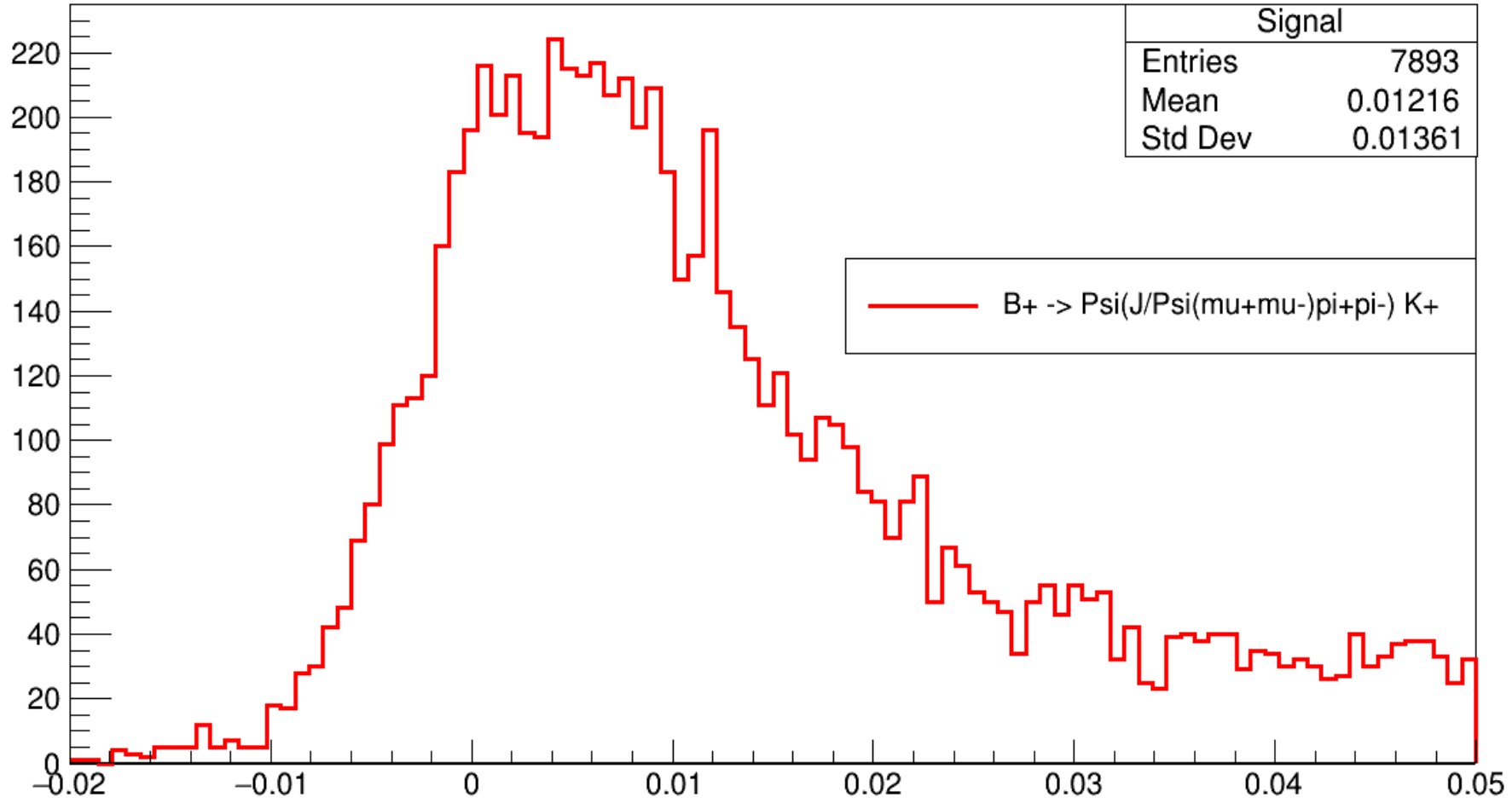
Root level cuts

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

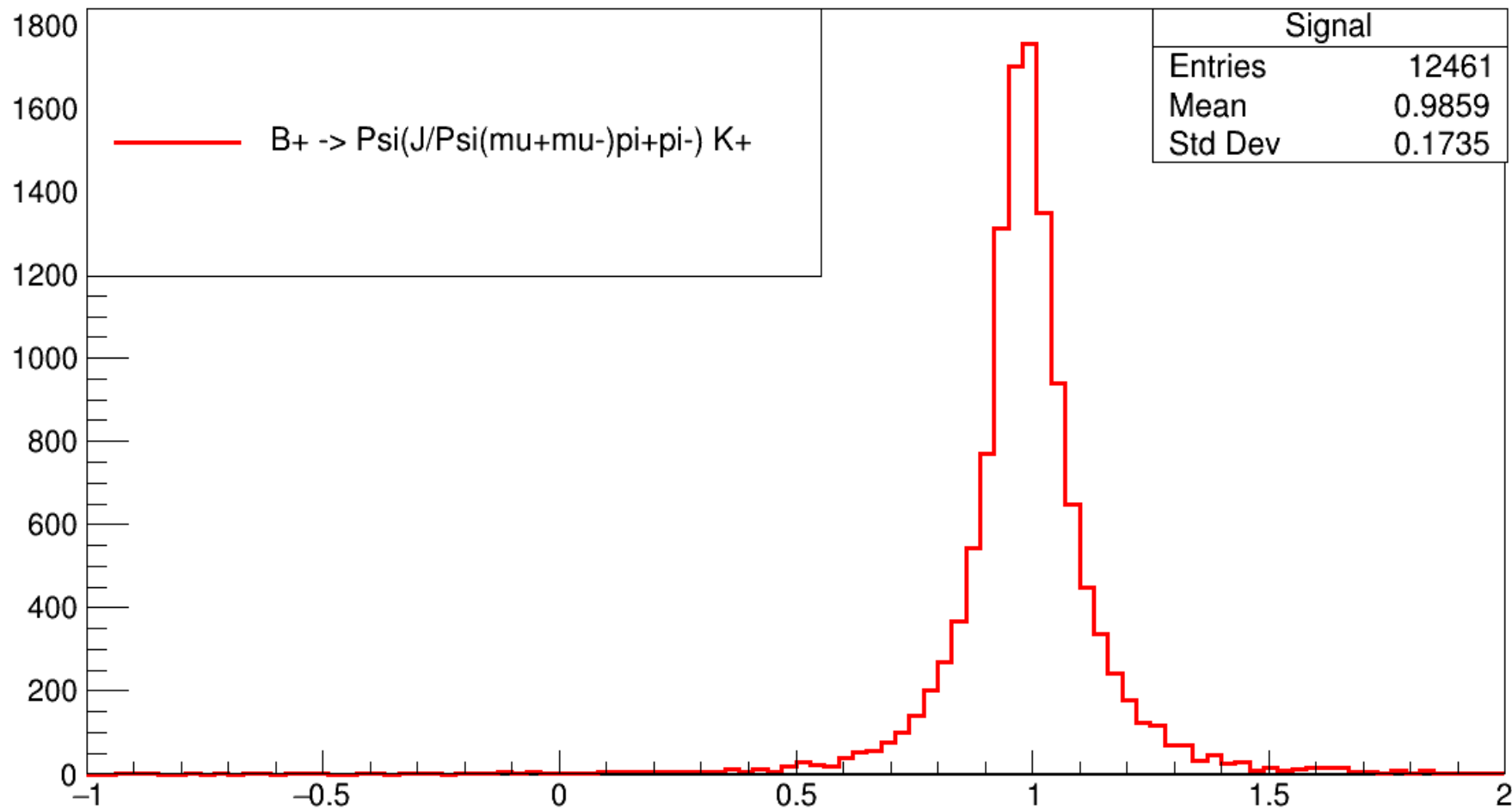
Mbc_Bsig with $|\sin(\phi)| < 1$, $-0.05 < \Delta E_{\text{Bsig}} < 0.05$ and Rank 1



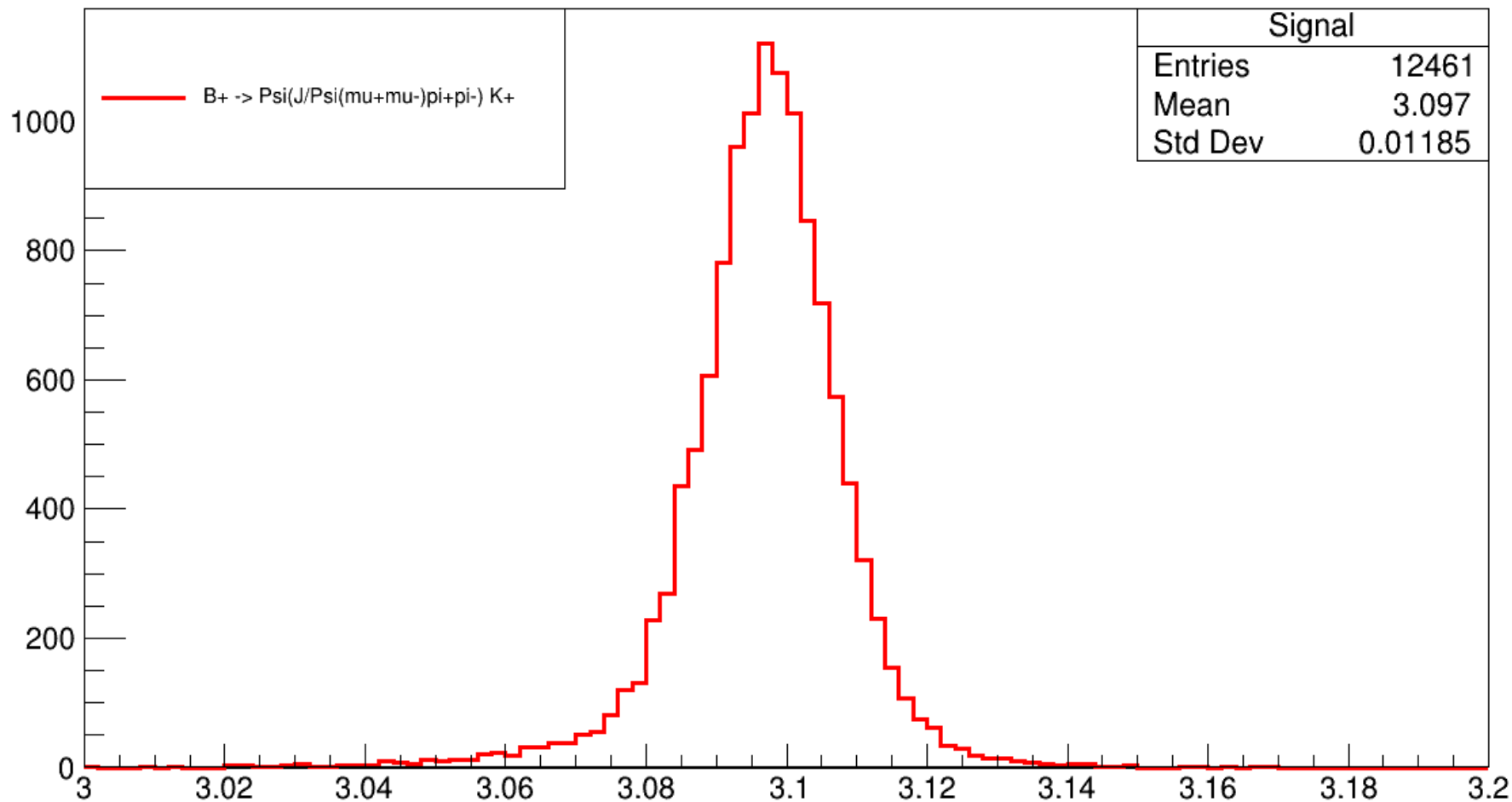
deltaE_Bsig with Rank 1, $-0.050 < \text{deltaE_Bsig} < 0.050$ and $|\text{abs}(\text{sin_phi})| < 1$



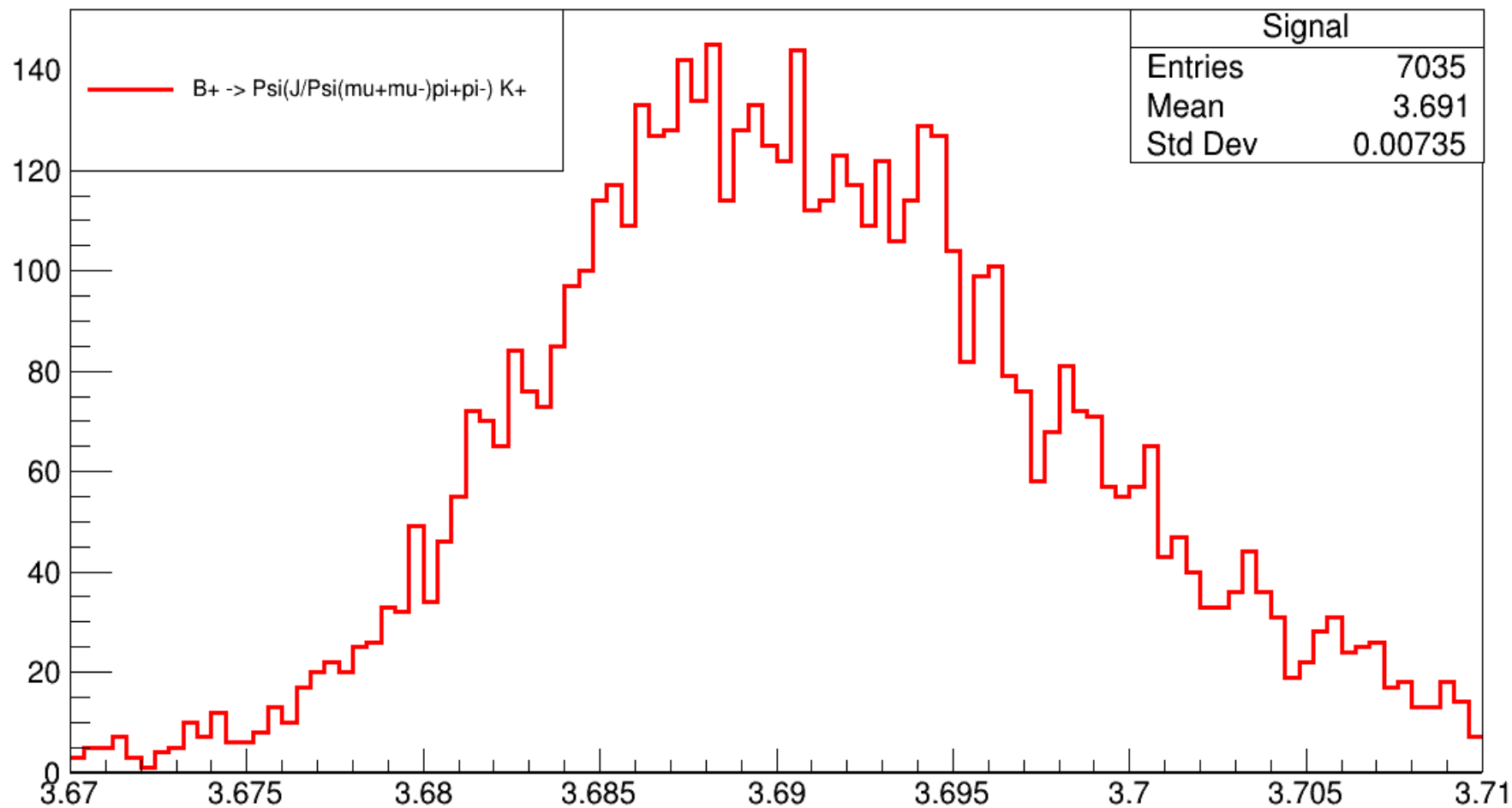
sin_phi with Rank 1, $-0.050 < \Delta E_{Bsig} < 0.050$ and $M_{bc_Bsig} > 5.27$



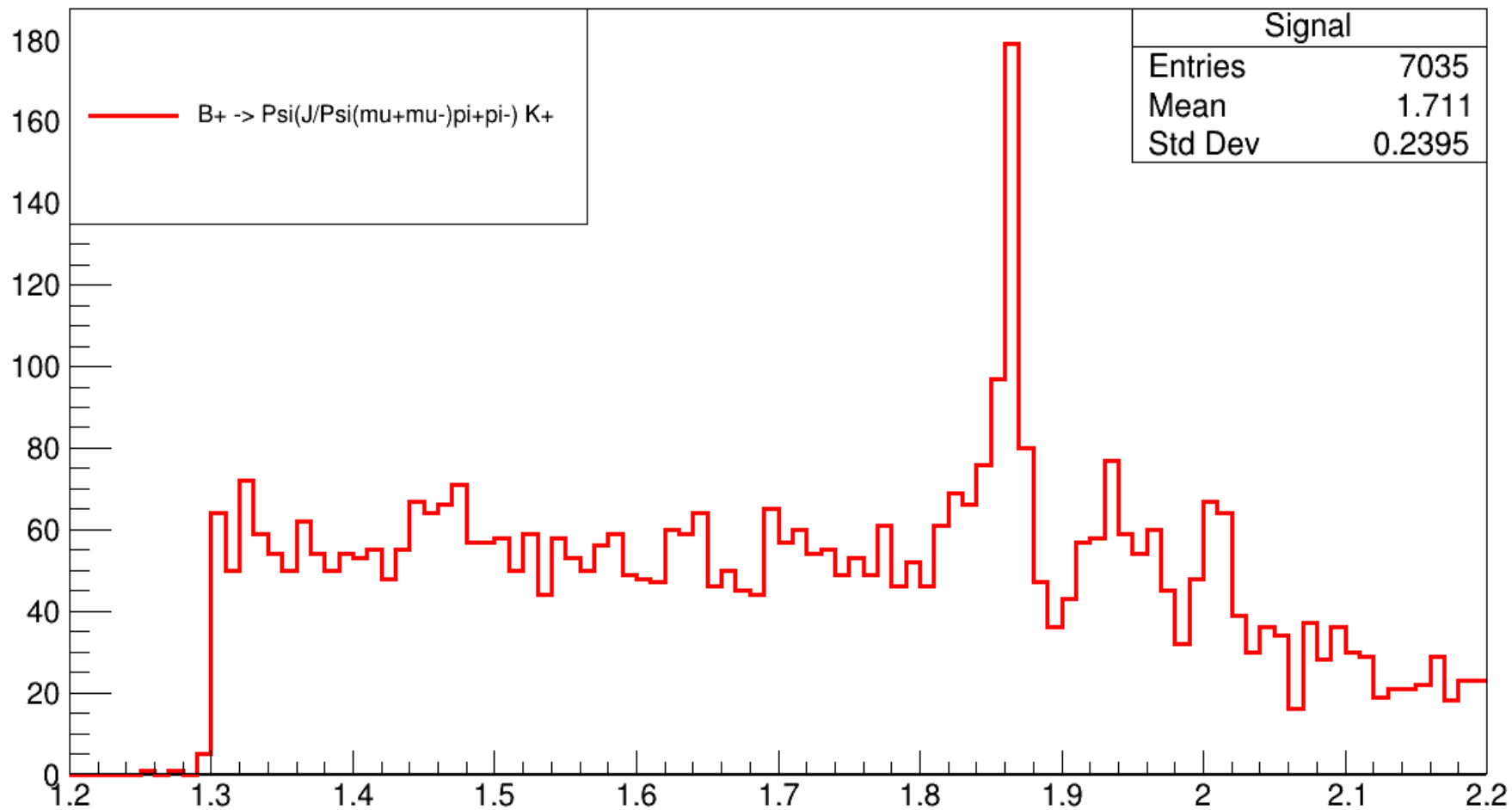
m_Jpsi with Rank 1, $-0.050 < \Delta E_{Bsig} < 0.050$ and $Mbc_{Bsig} > 5.27$



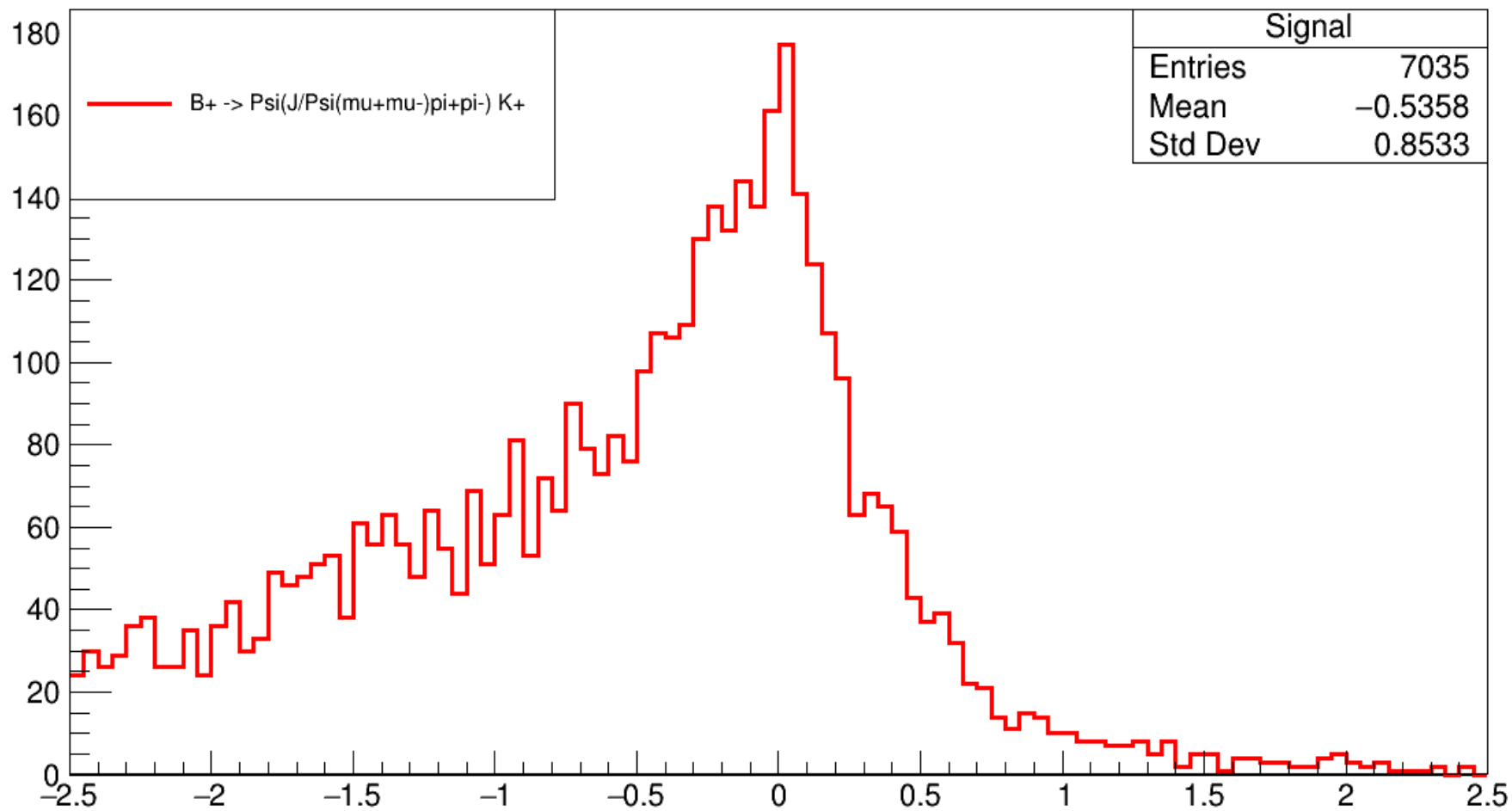
m_psi with Rank 1, abs(sin_phi)<1, Mbc_Bsig>5.27 and -0.050<deltaE_Bsig<0.050



m_hadROE with $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$, $-0.05 < \Delta E_{Bsig} < 0.05$ and Rank 1

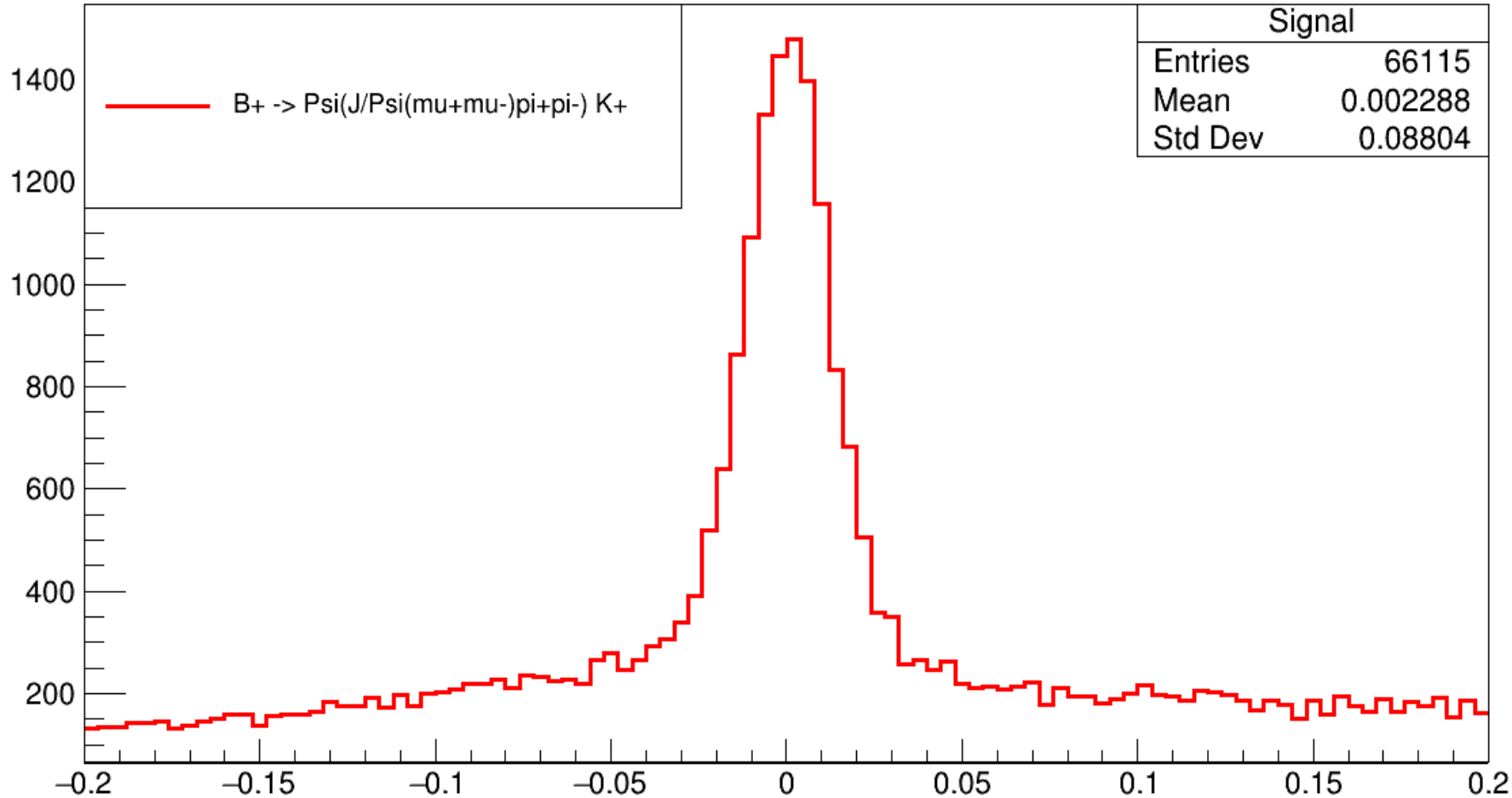


$\Delta\cos\theta$ with Rank 1, $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$ and $-0.050 < \Delta E_{Bsig} < 0.050$

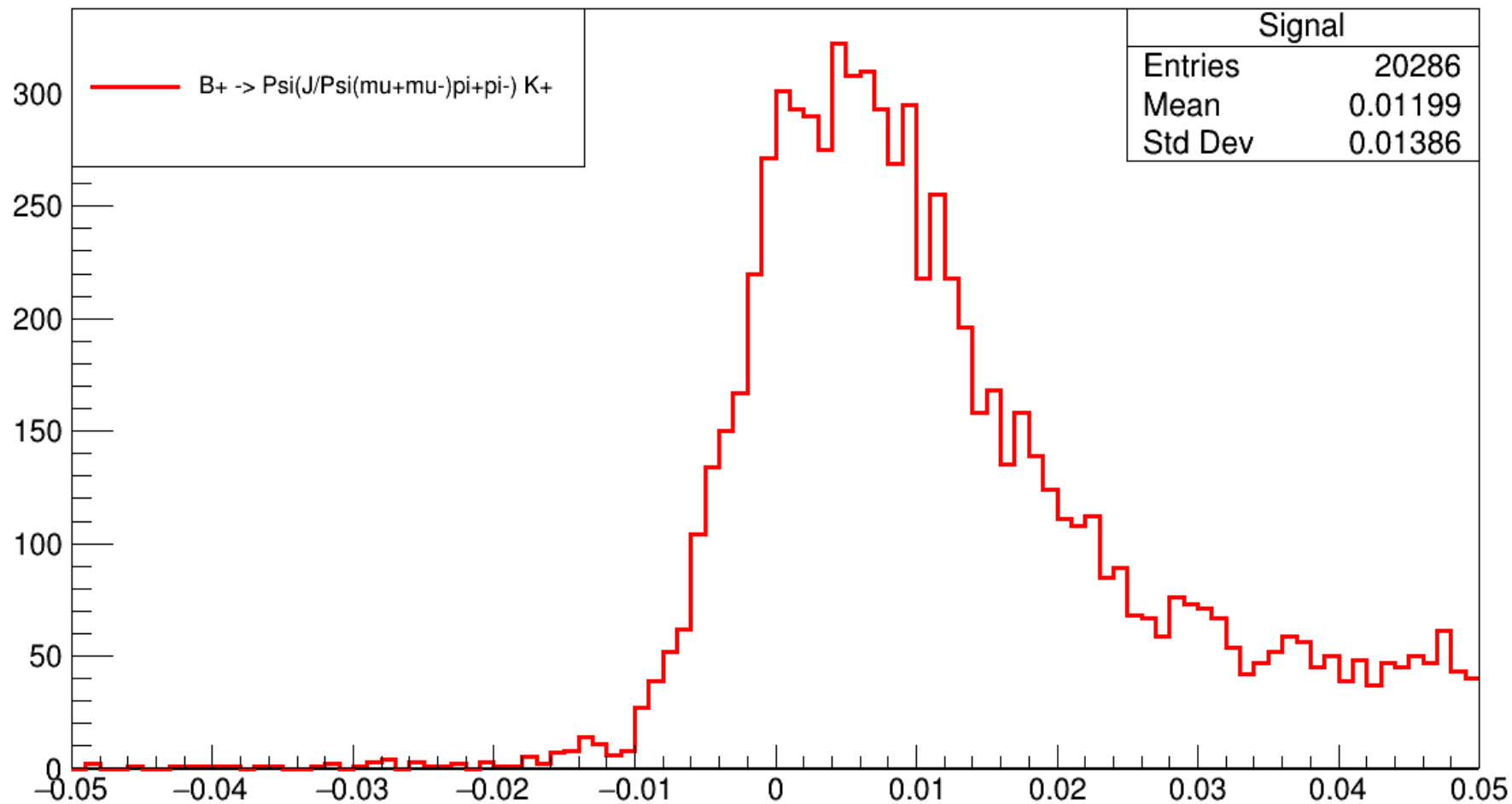


Back up

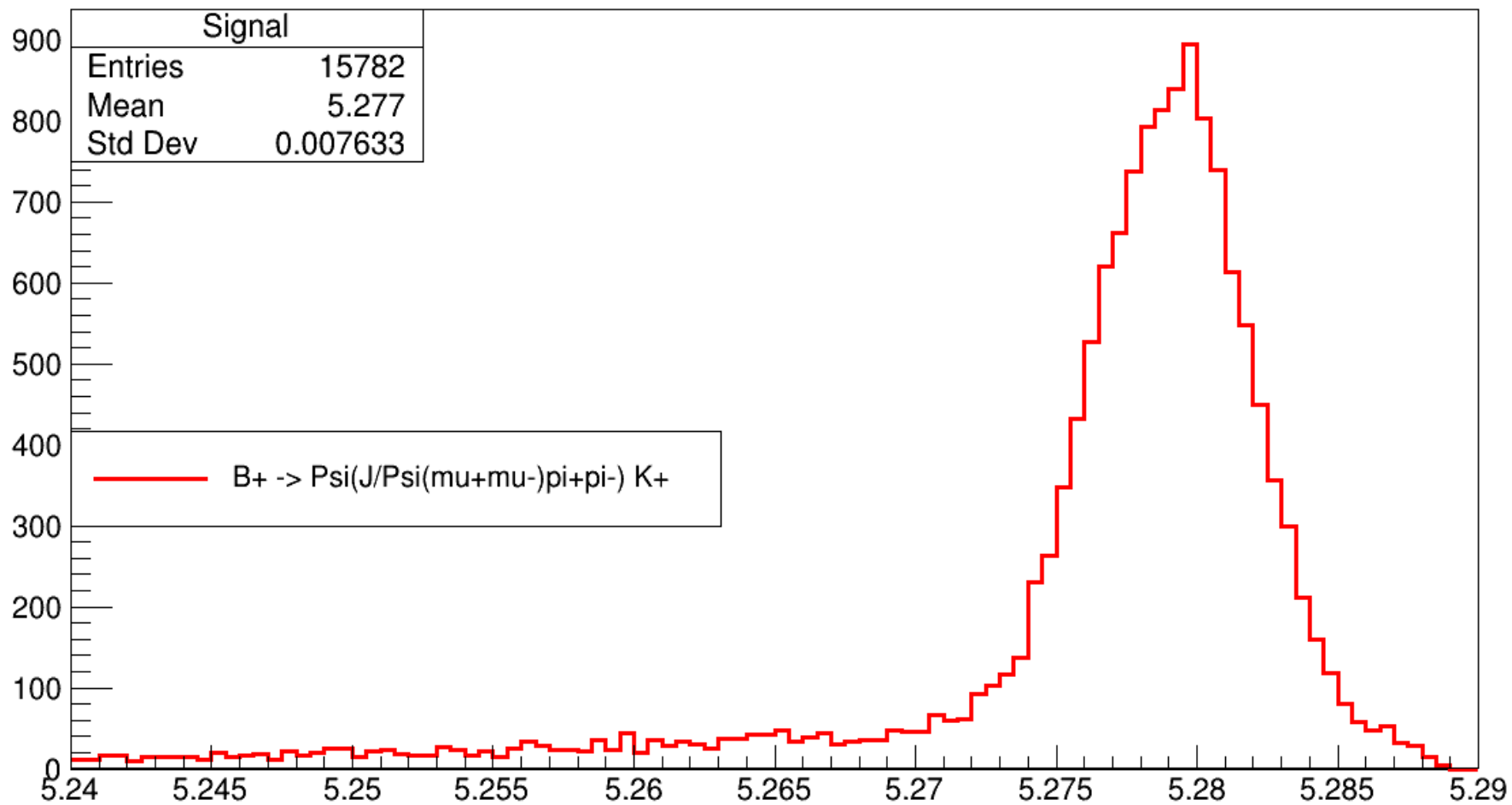
deltaE_Bsig with Rank 1



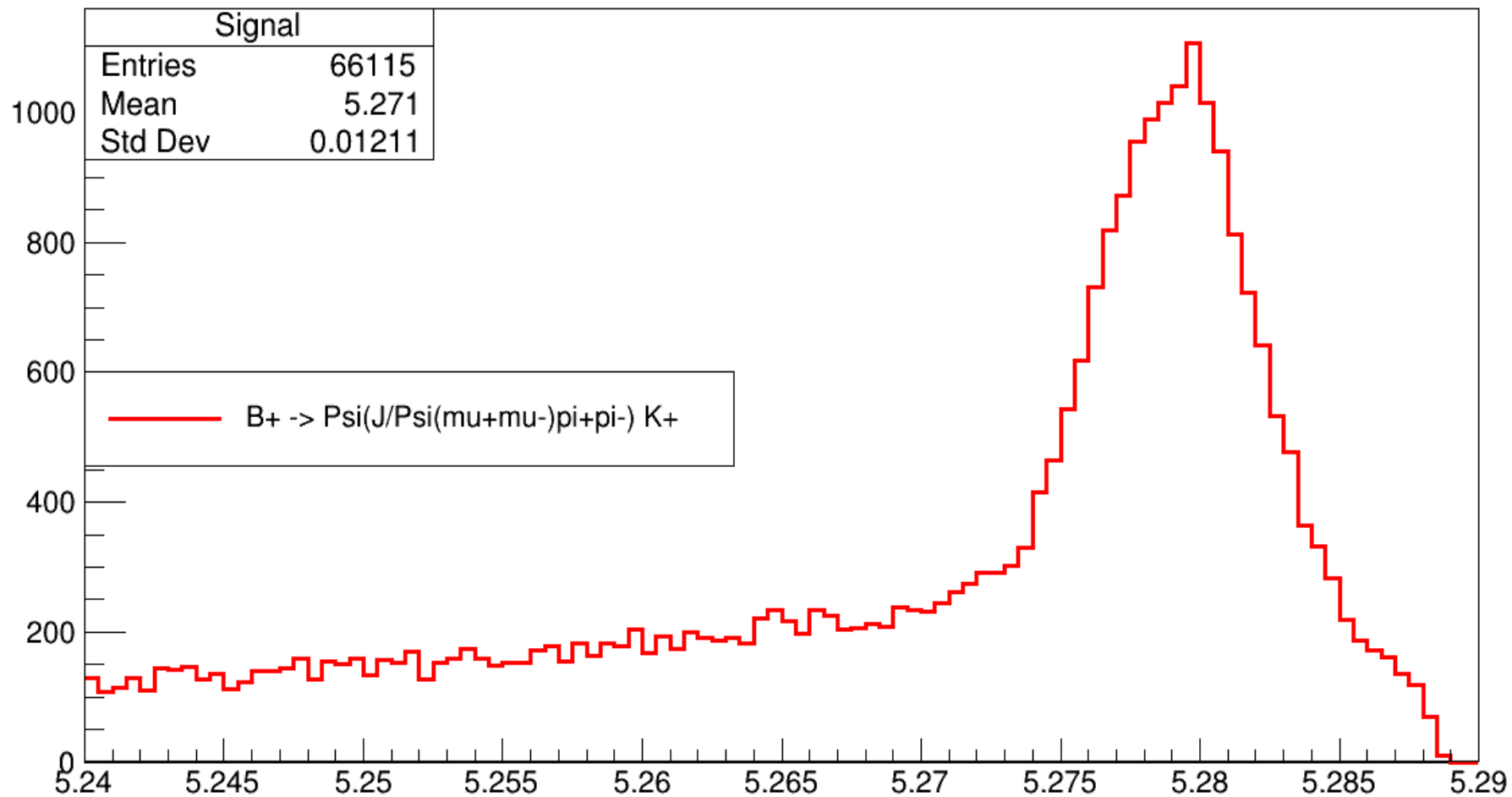
deltaE_Bsig with Rank 1 and abs(sin_phi)<1



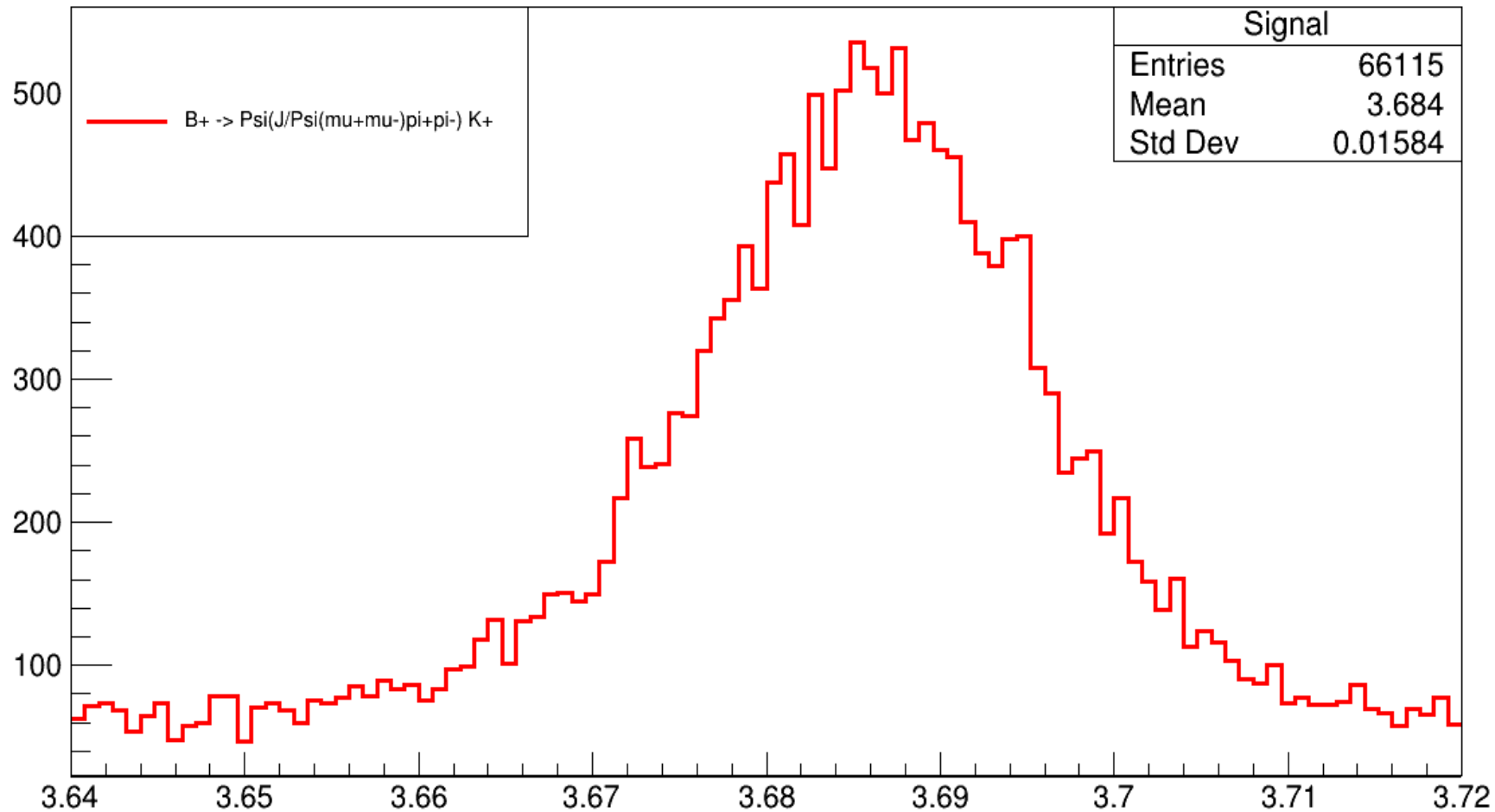
Mbc_Bsig with $-0.05 < \text{deltaE_Bsig} < 0.05$ and Rank 1



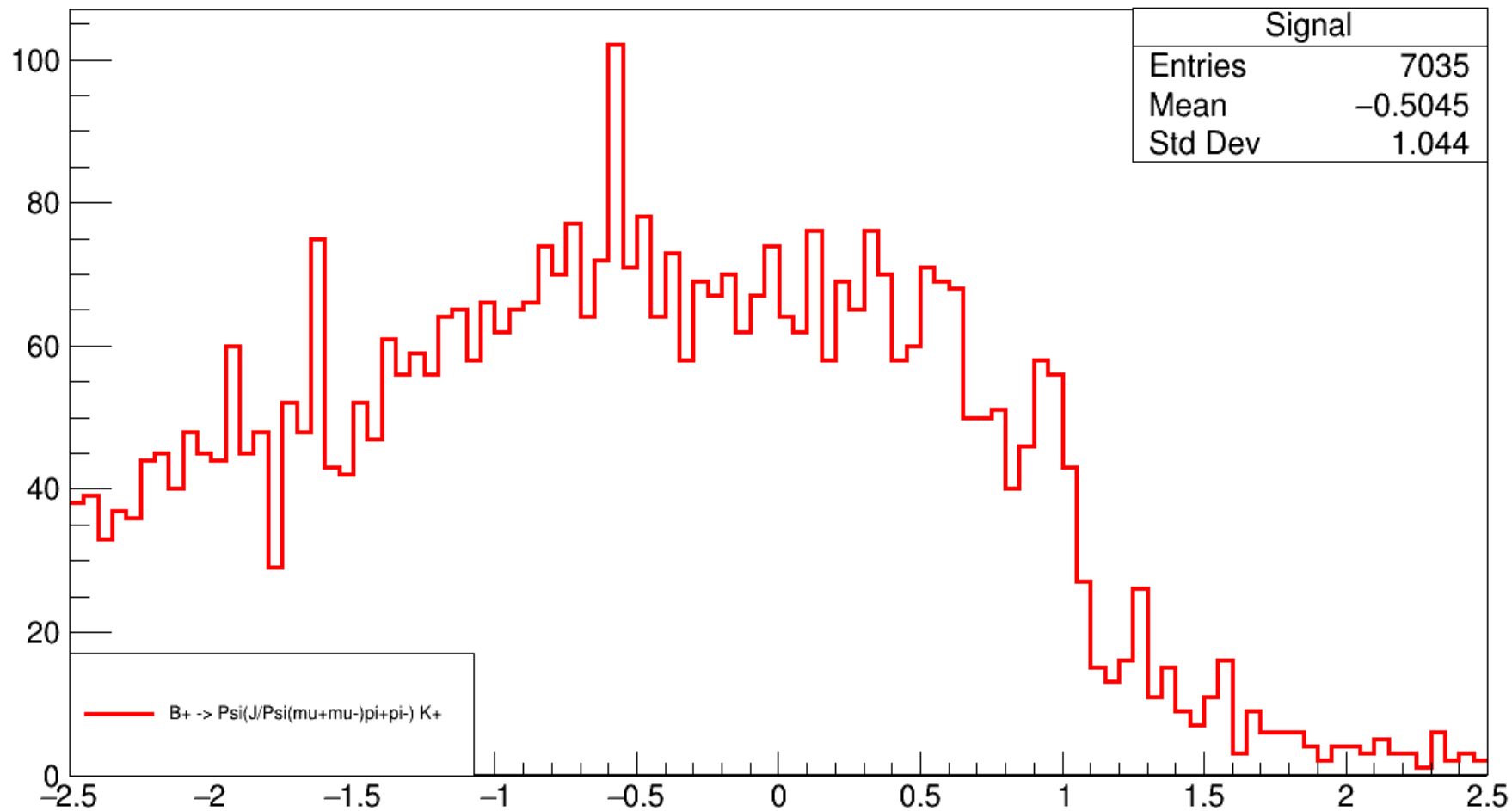
Mbc_Bsig with Rank 1



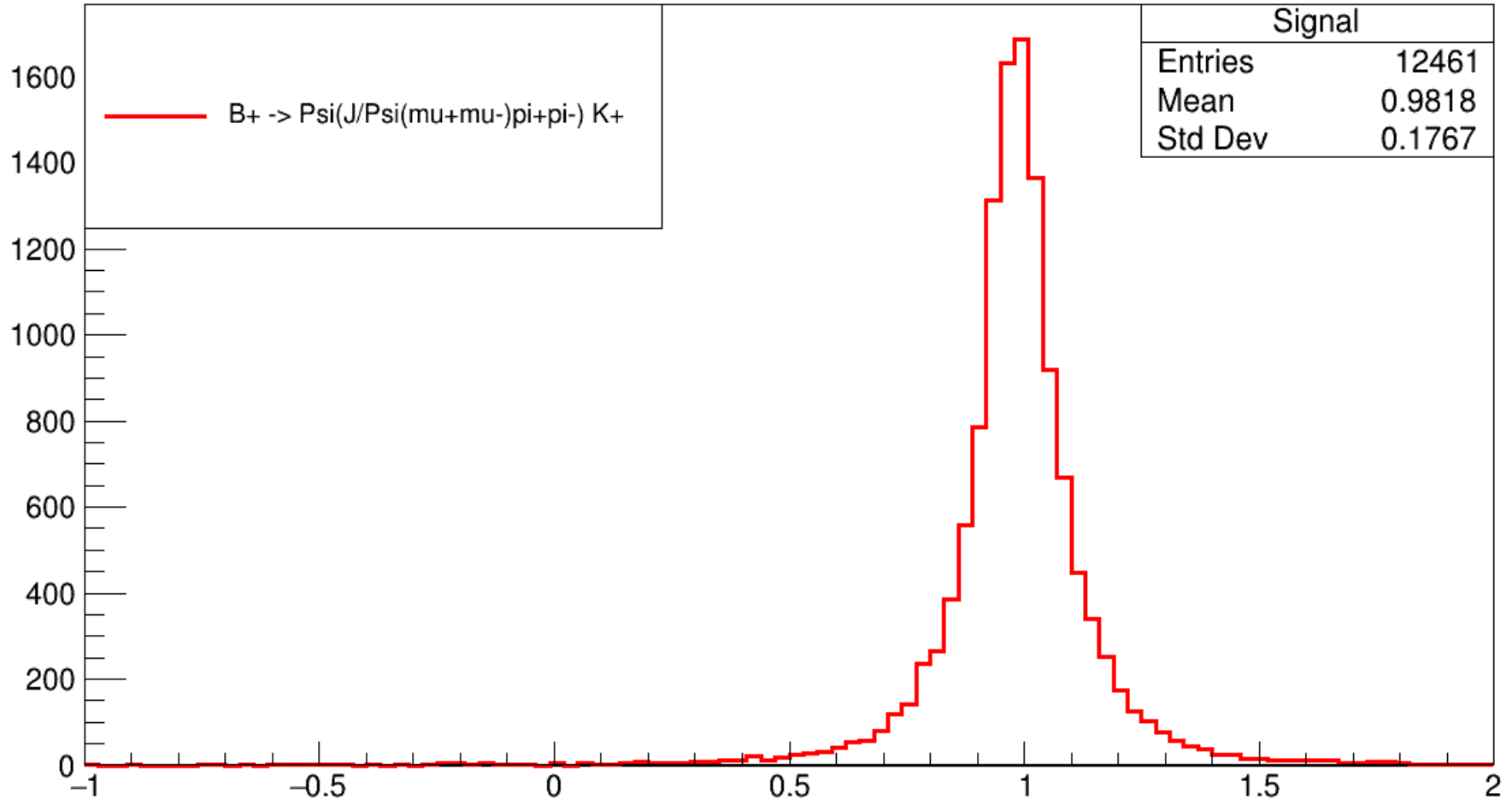
m_psi with Rank 1



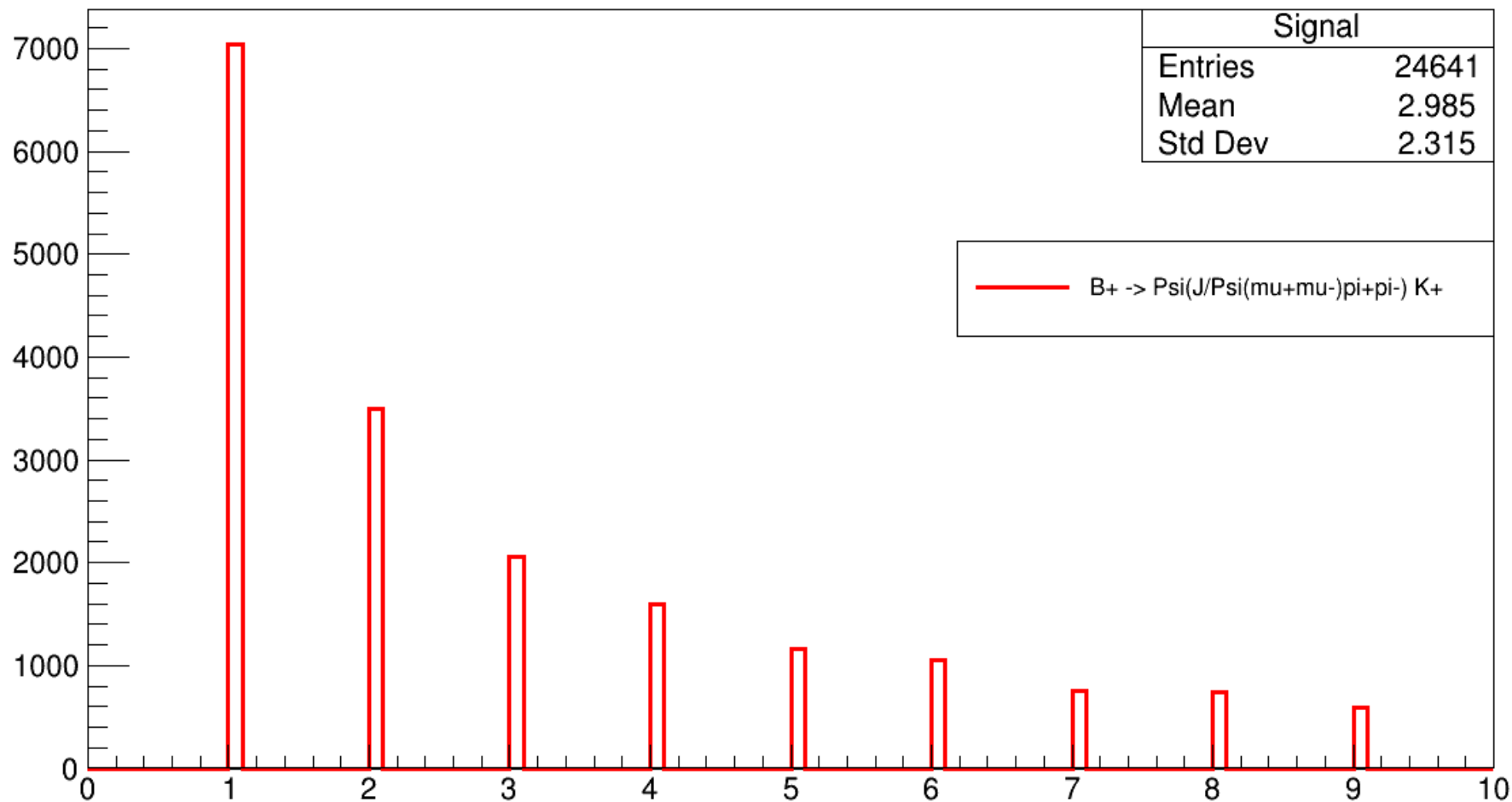
$\cos(p_{\text{Btag}}, p_{\text{Btag_vis}})$ with Rank 1, $|\sin(\phi)| < 1$, $M_{bc_Bsig} > 5.27$ and $-0.050 < \Delta E_{Bsig} < 0.050$



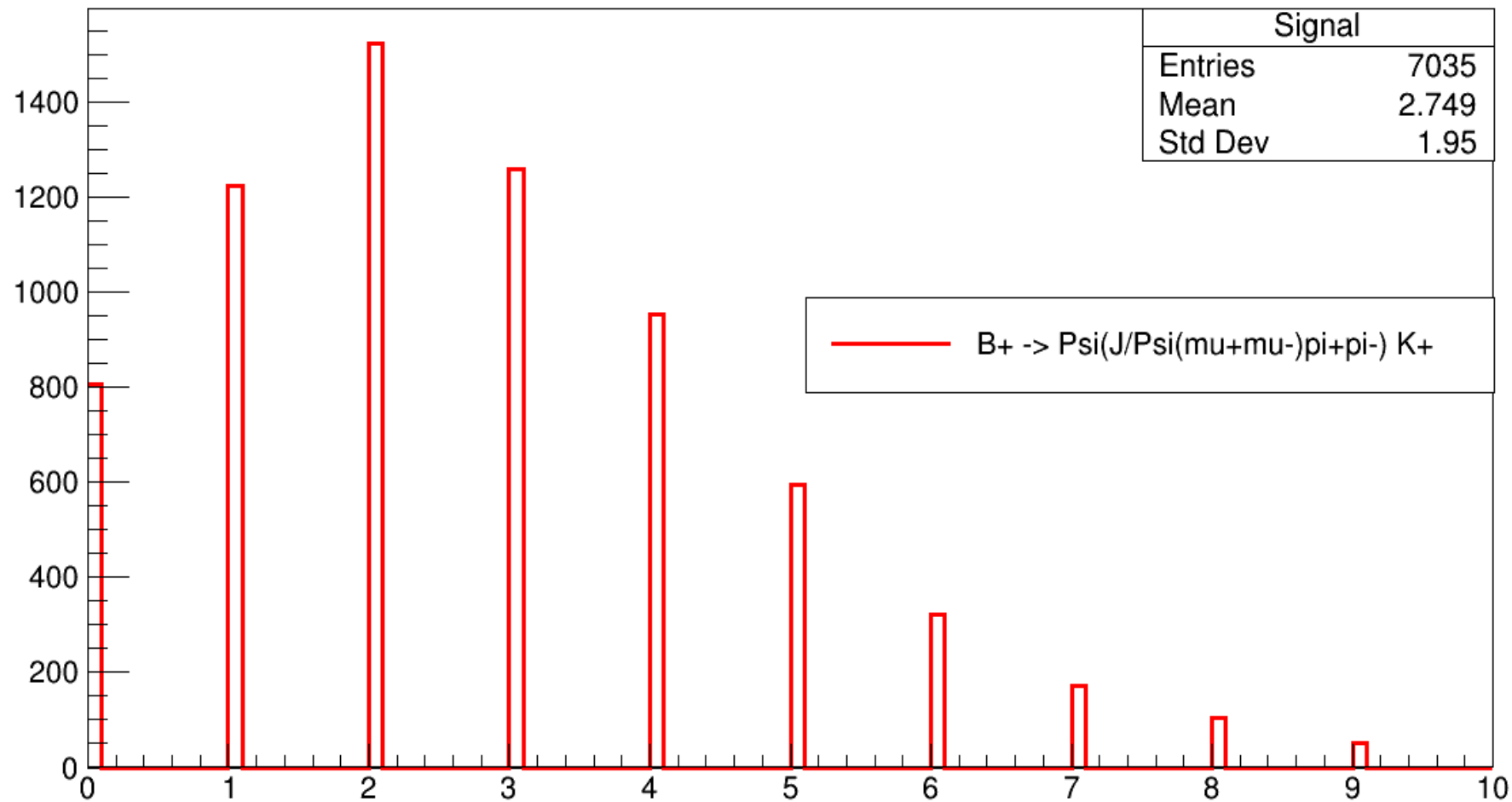
sin_phi_reco_psi_mass with Rank 1, $-0.050 < \Delta E_{Bsig} < 0.050$ and $M_{bc_Bsig} > 5.27$



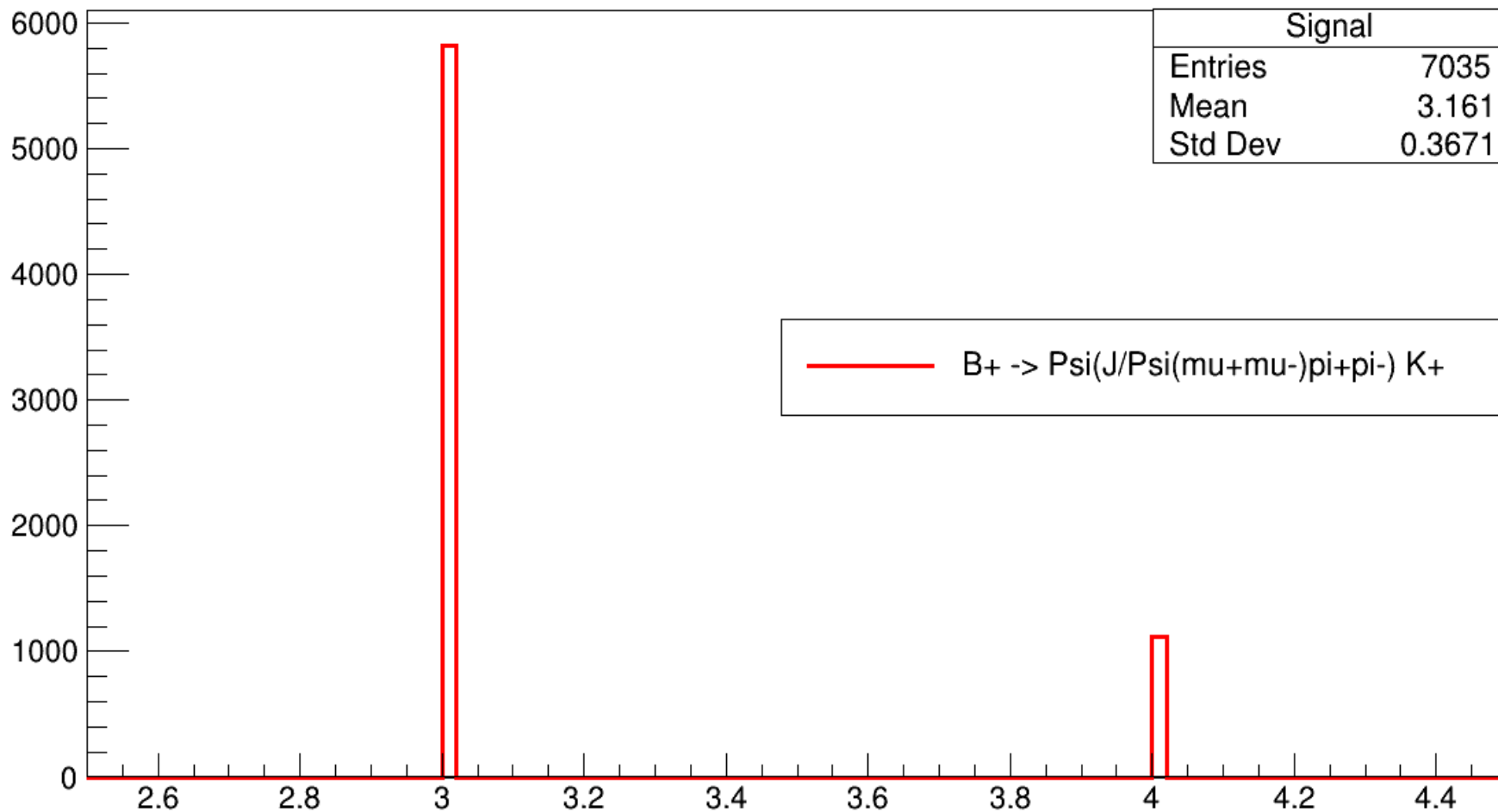
Number of candidates with $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$ and $-0.050 < \Delta E_{Bsig} < 0.050$



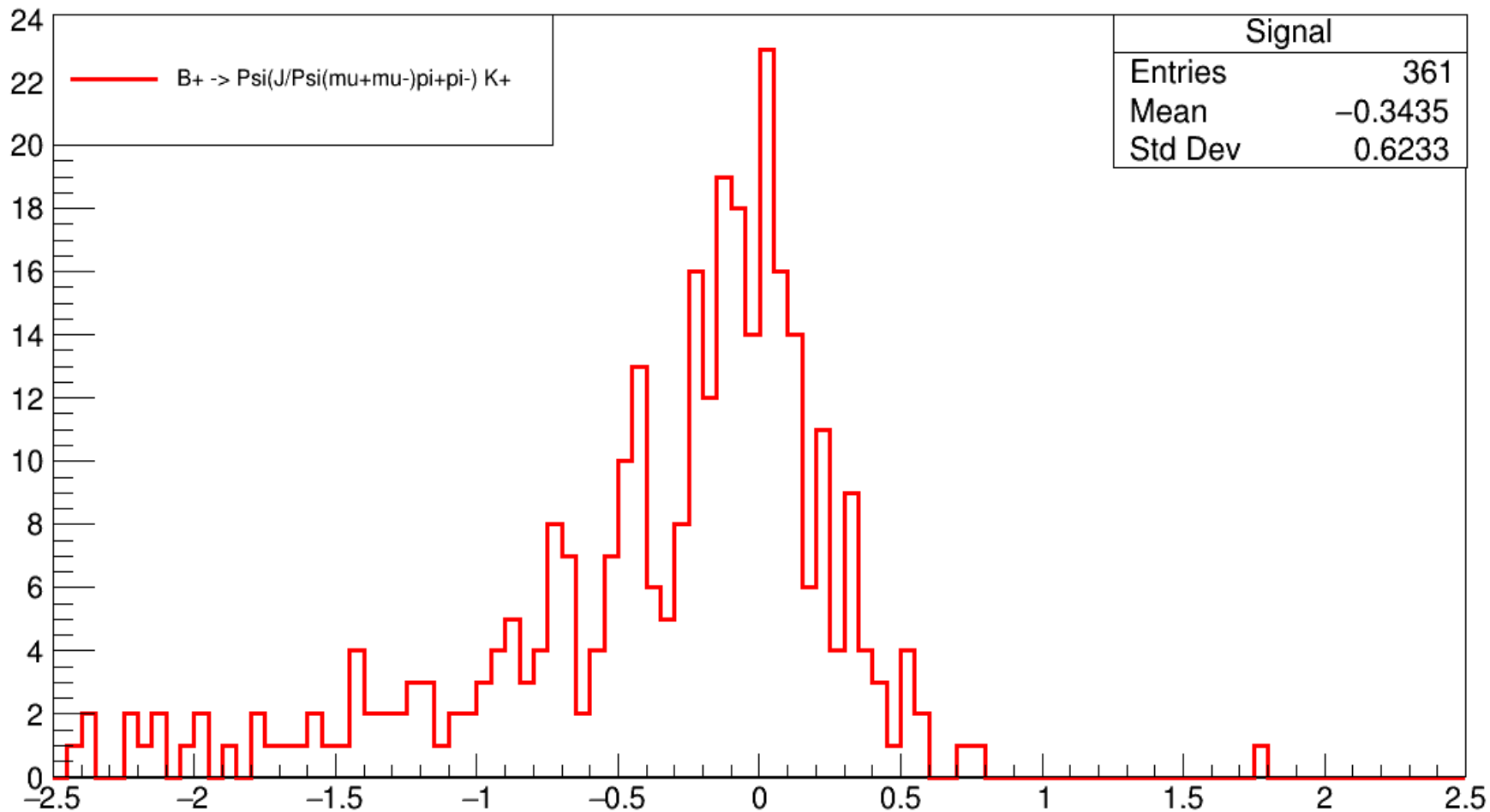
Number of photons with Rank1, $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$ and $-0.050 < \Delta E_{Bsig} < 0.050$



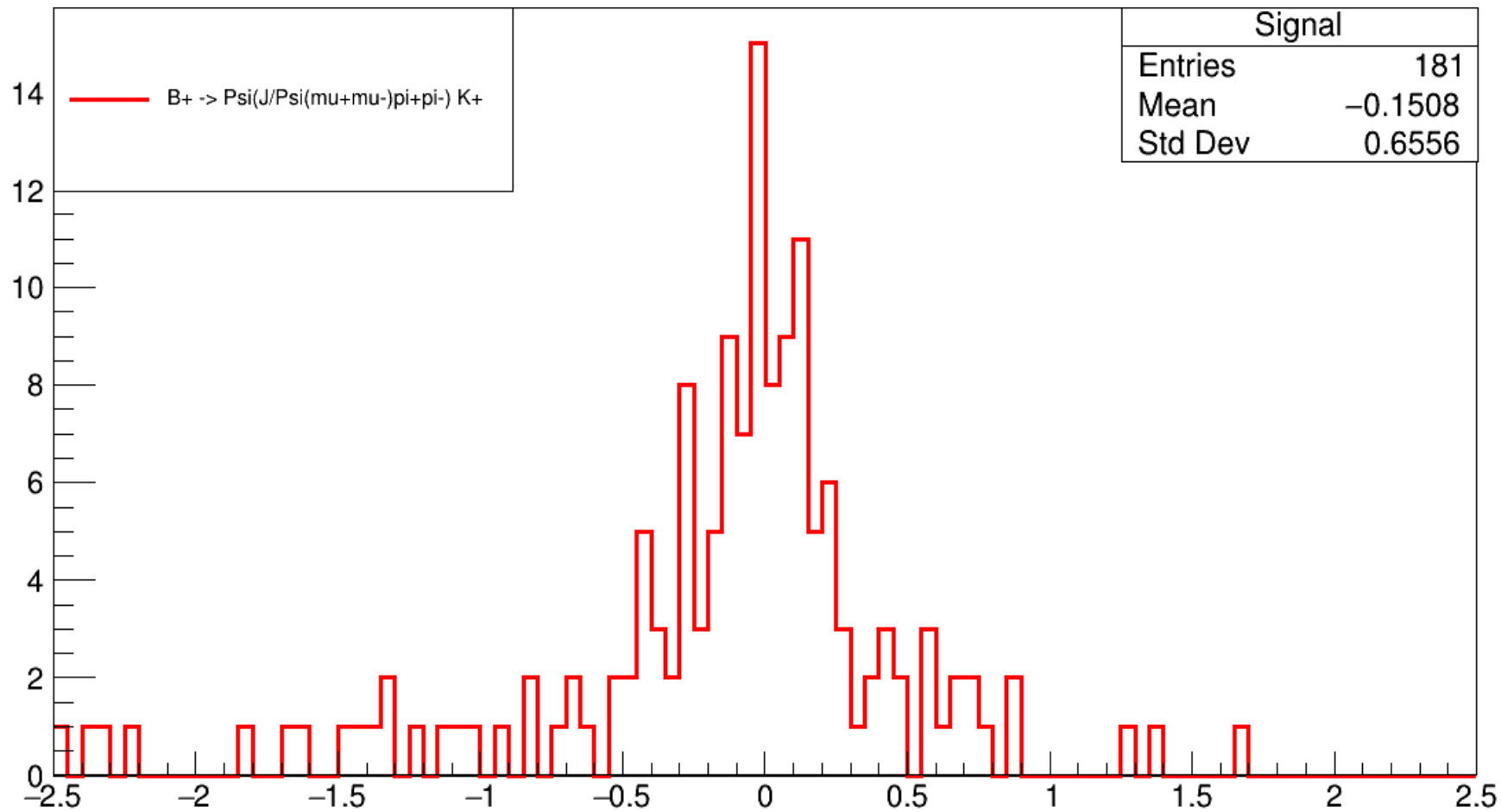
Number of leptons with Rank1, abs(sin_phi)<1, Mbc_Bsig>5.27 and -0.050<deltaE_Bsig<0.050



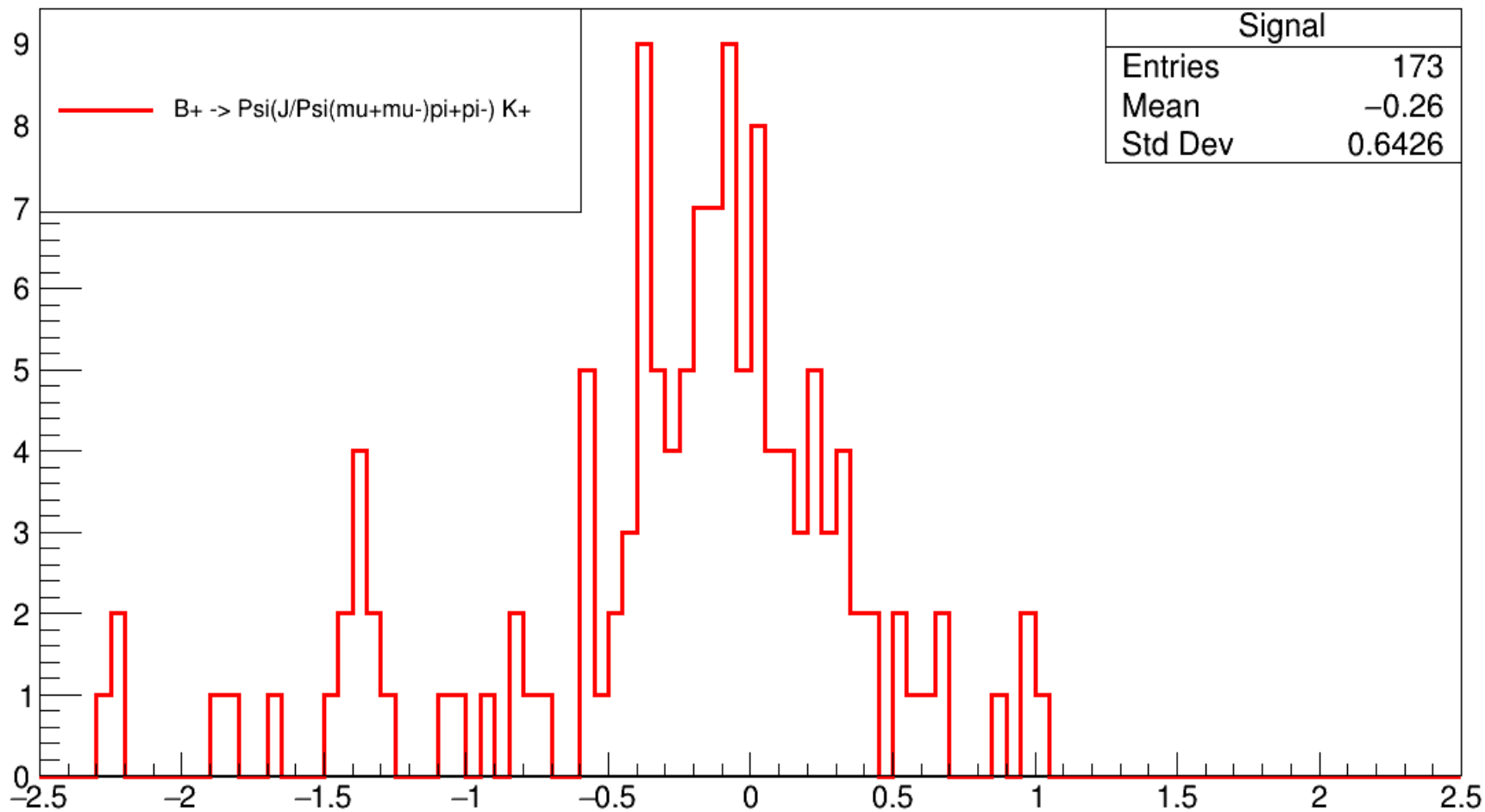
$\Delta\cos\theta$ with Rank 1, $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$, $-0.050 < \Delta E_{Bsig} < 0.050$ and $|\Delta m_{hadROE} - 1.86| < 0.015$



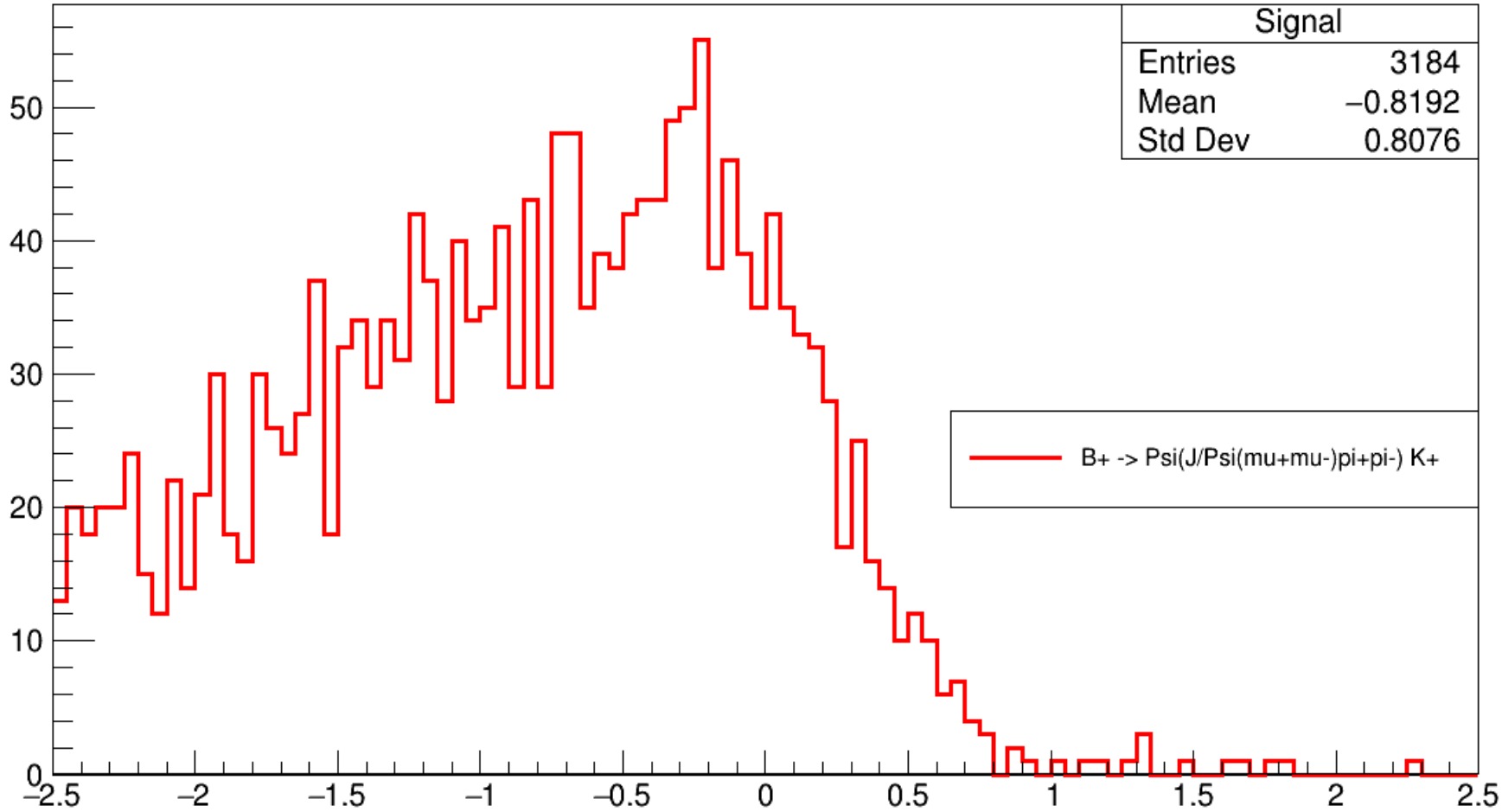
$\Delta\cos\theta$ with Rank 1, $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$, $-0.050 < \Delta E_{Bsig} < 0.050$ and $|\text{m_hadROE} - 2.006| < 0.015$



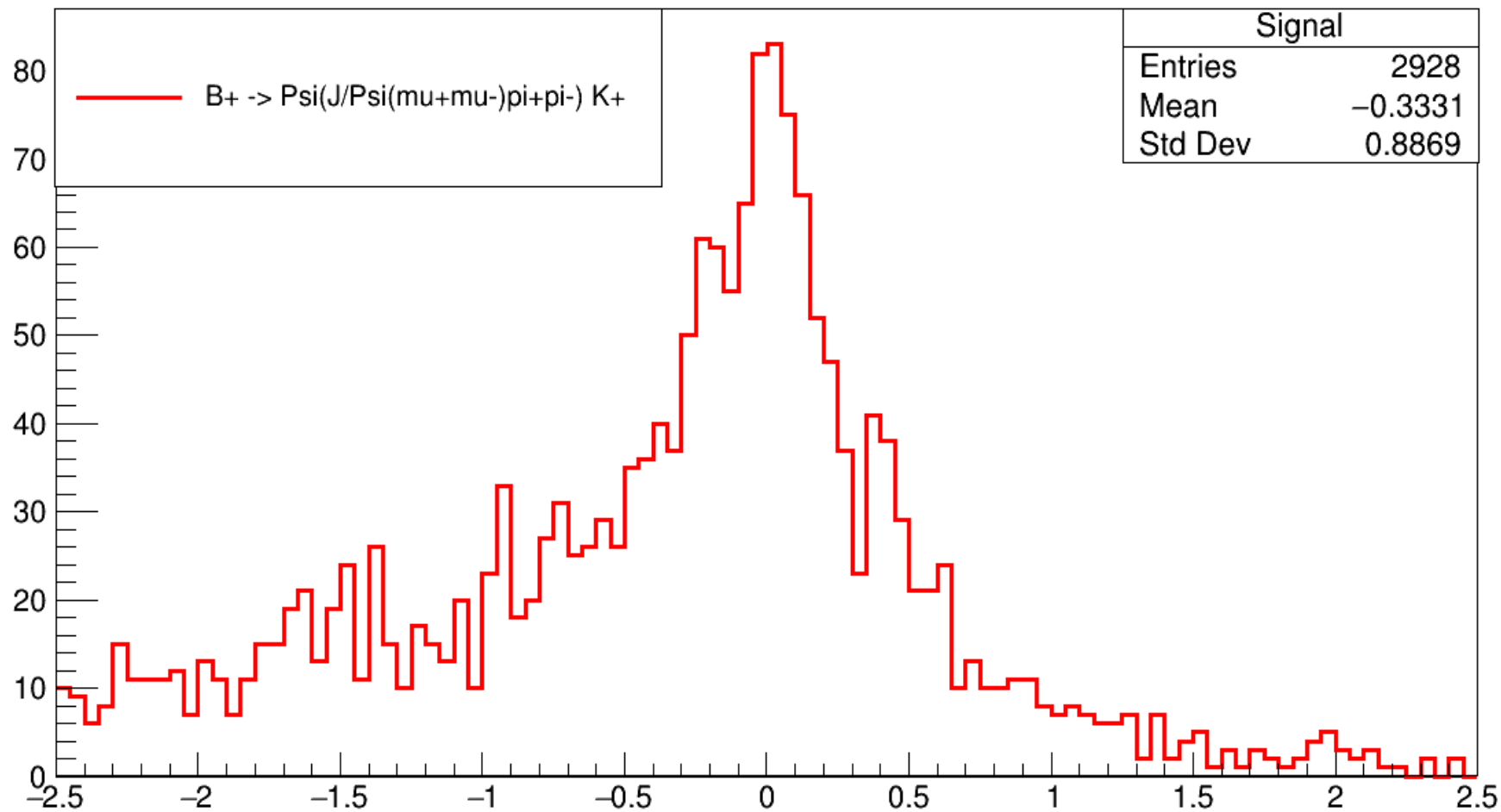
$\Delta\cos\theta$ with Rank 1, $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$, $-0.050 < \Delta E_{Bsig} < 0.050$ and $|\Delta m_{hadROE} - 1.96| < 0.015$



$\Delta\cos\theta$ with Rank 1, $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$, $-0.050 < \Delta E_{Bsig} < 0.050$ and $m_{hadROE} < 1.86$

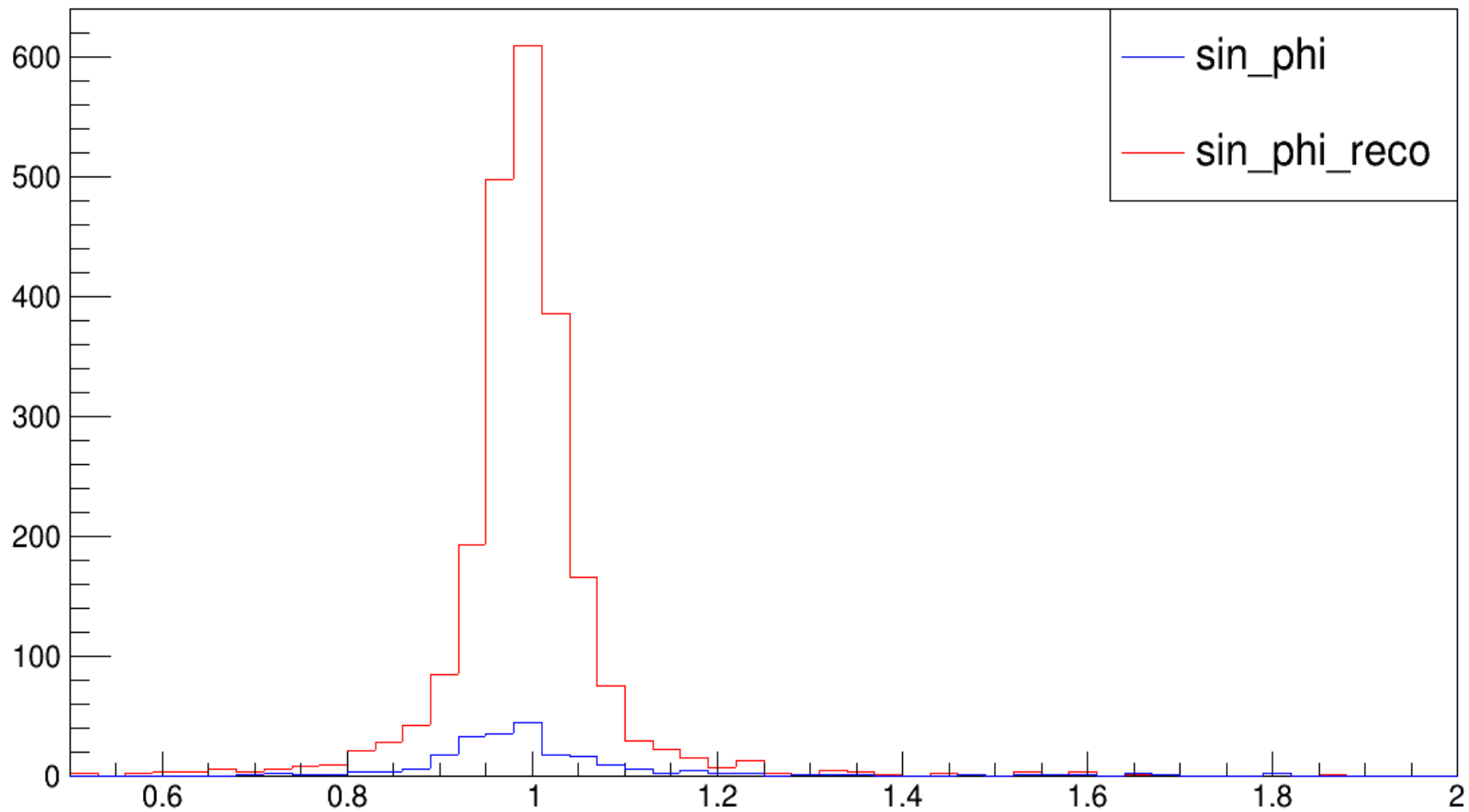


$\Delta\cos\theta$ with Rank 1, $|\sin\phi| < 1$, $M_{bc_Bsig} > 5.27$, $-0.050 < \Delta E_{Bsig} < 0.050$ and $m_{hadROE} > 2.006$



Projection plots from second control
channel

sin_phi_PDG&sin_phi_reco_psi_mass with Rank 1, $-0.050 < \Delta E < 0.050$ and $M_{bc_Bsig} > 5.27$



Graph

