

# Updates

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# Cherenkov Angle

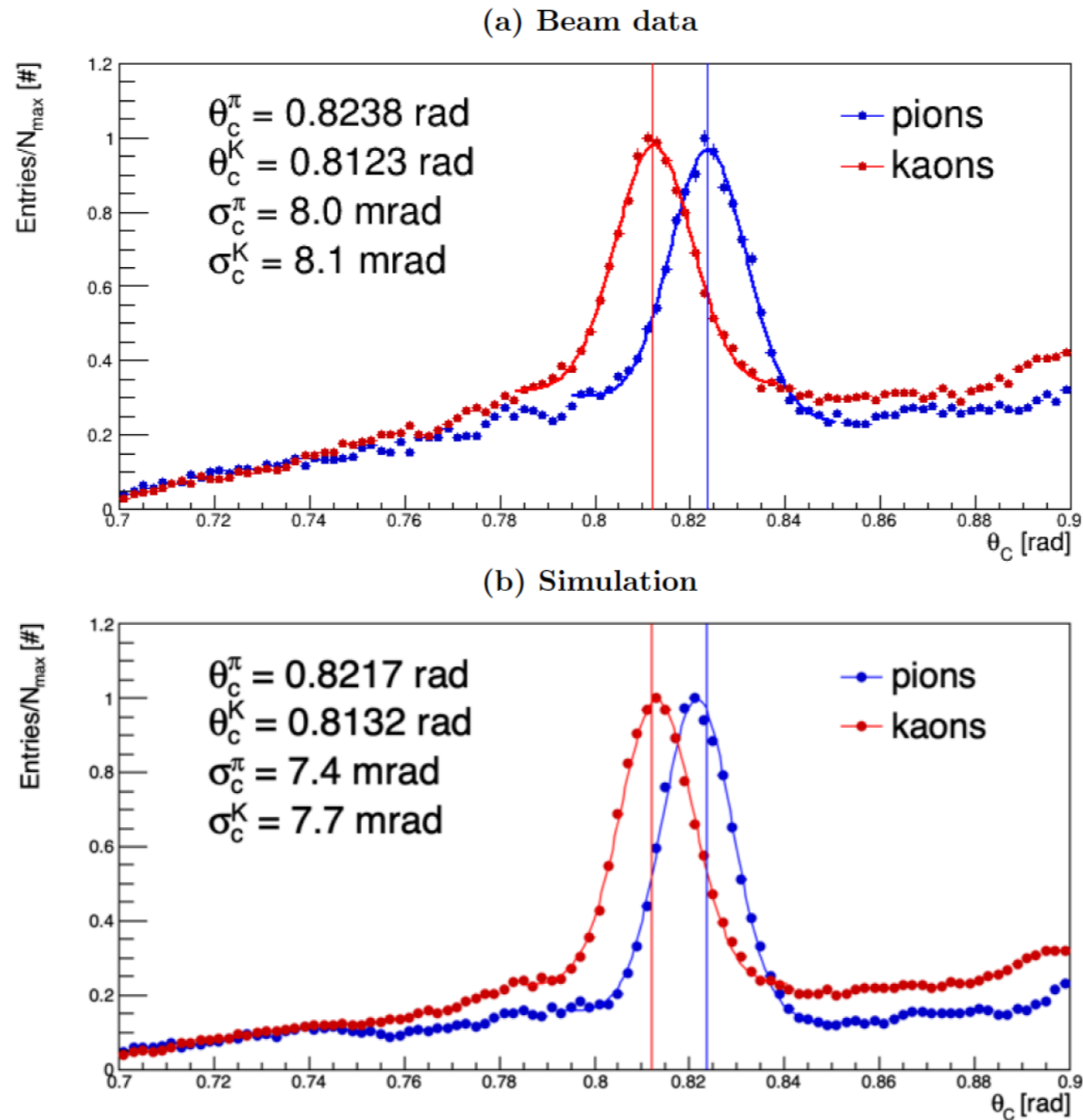


Figure 2.11: Cherenkov angle  $\theta_C$  distribution per photon for identified pions (blue) and kaons (red) within a momentum range between 2.8-3.4 GeV/c a) commissioning beam data b) simulation.

# Photon Yield

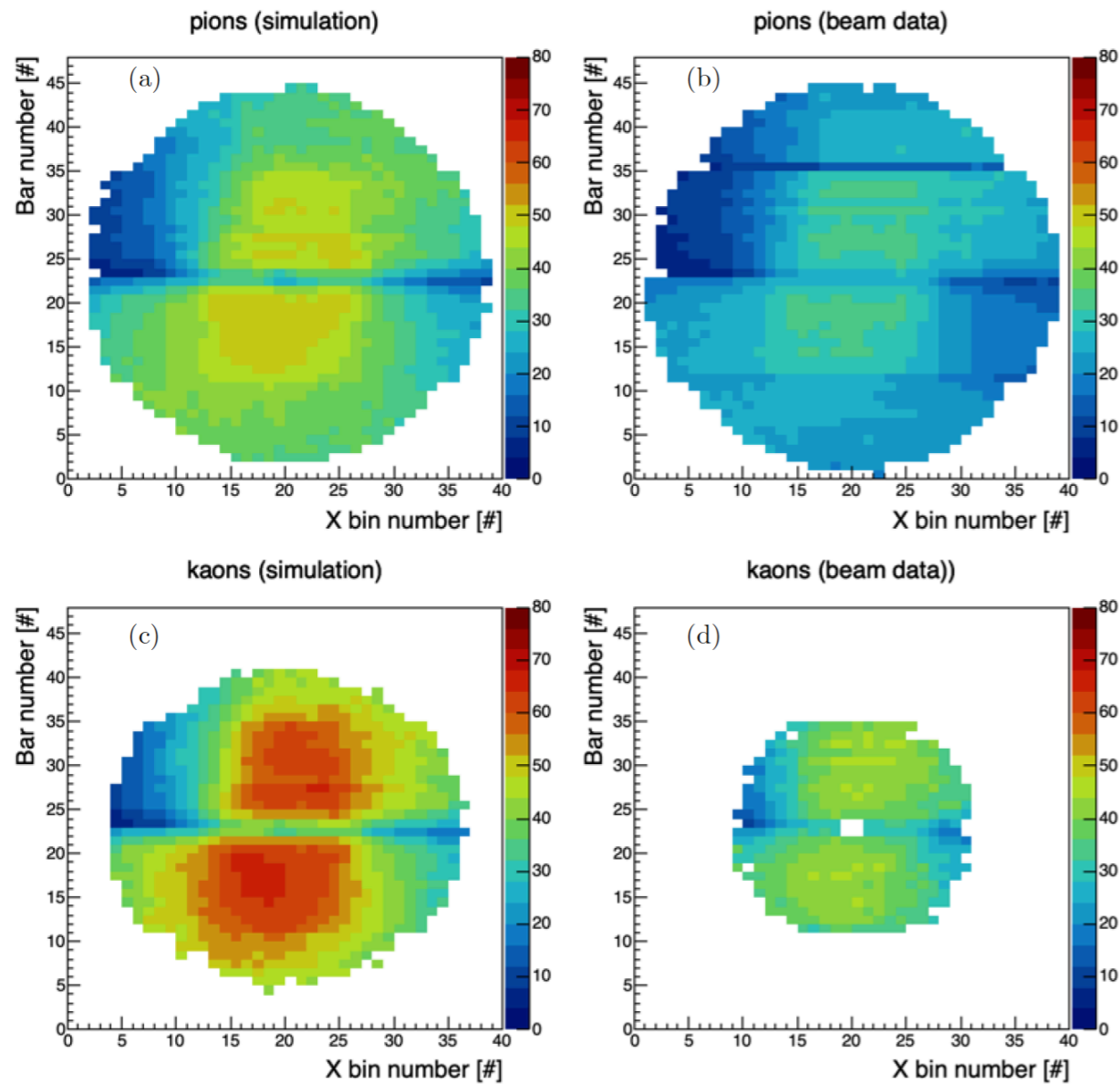


Figure 2.14: Photon yield maps for pions and kaons identified through the  $\rho$  and  $\phi$  reactions at (3-3.5) GeV/c momentum. (a) pion tracks simulation, (b) pion tracks beam data, (c) Kaon tracks simulation, (d) kaon tracks beam data.

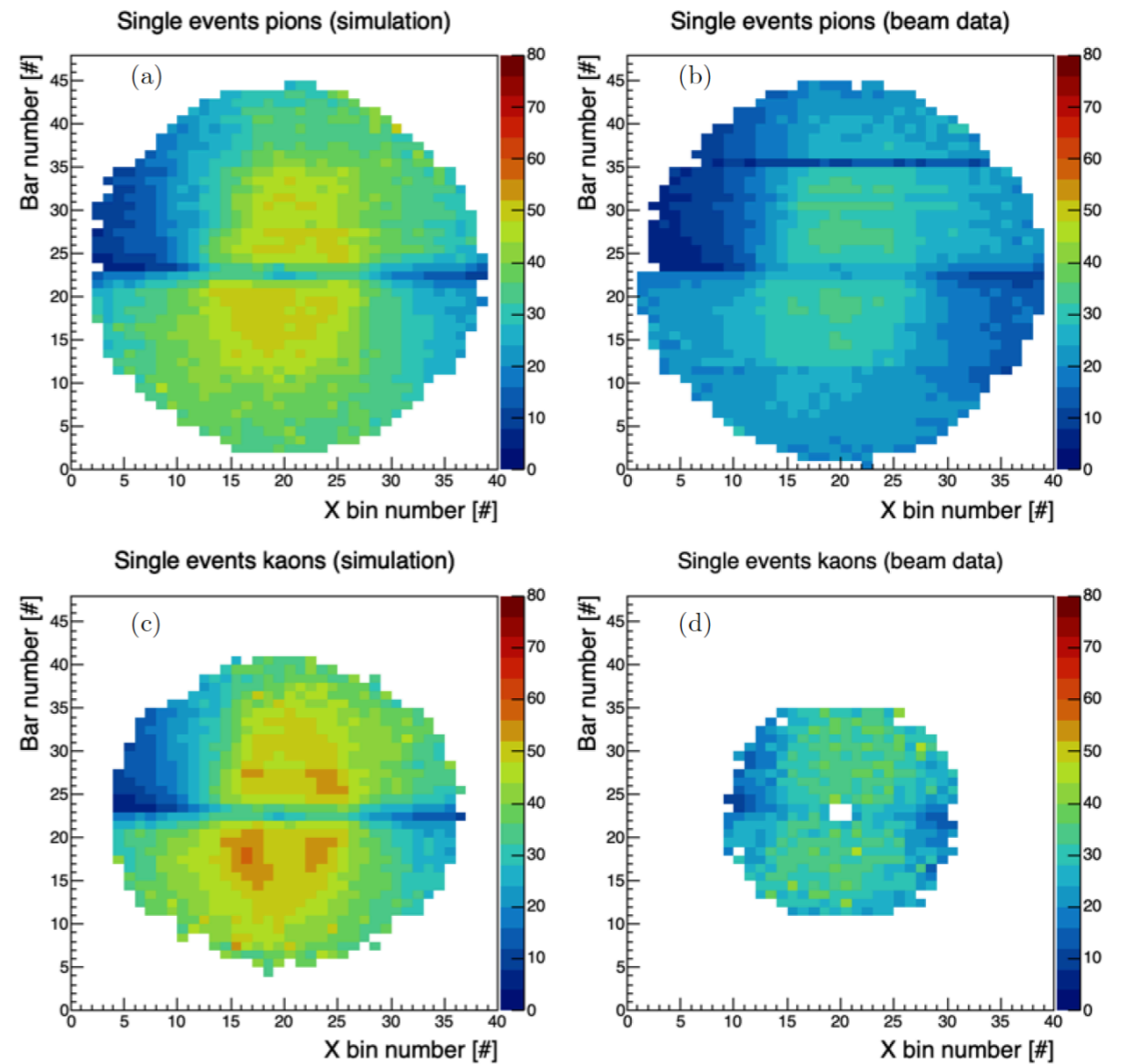


Figure 2.15: Photon yield maps for pions and kaons identified through the  $\rho$  and  $\phi$  reactions at (3-3.5) GeV/c momentum using events that have single track at the DIRC wall. (a) pion tracks simulation, (b) pion tracks beam data, (c) Kaon tracks simulation and (d) kaon tracks beam data.

# Cherenkov Angle Shift

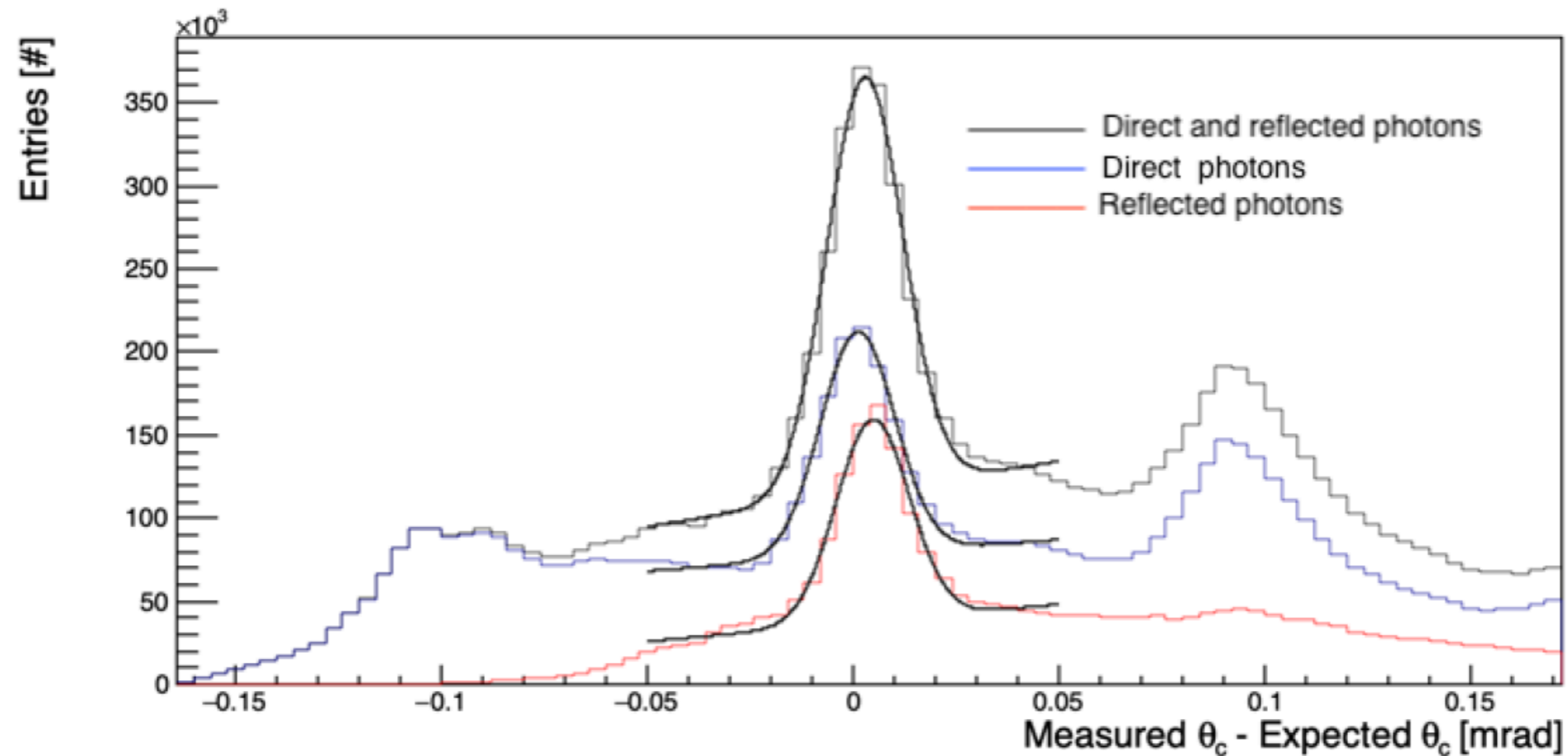
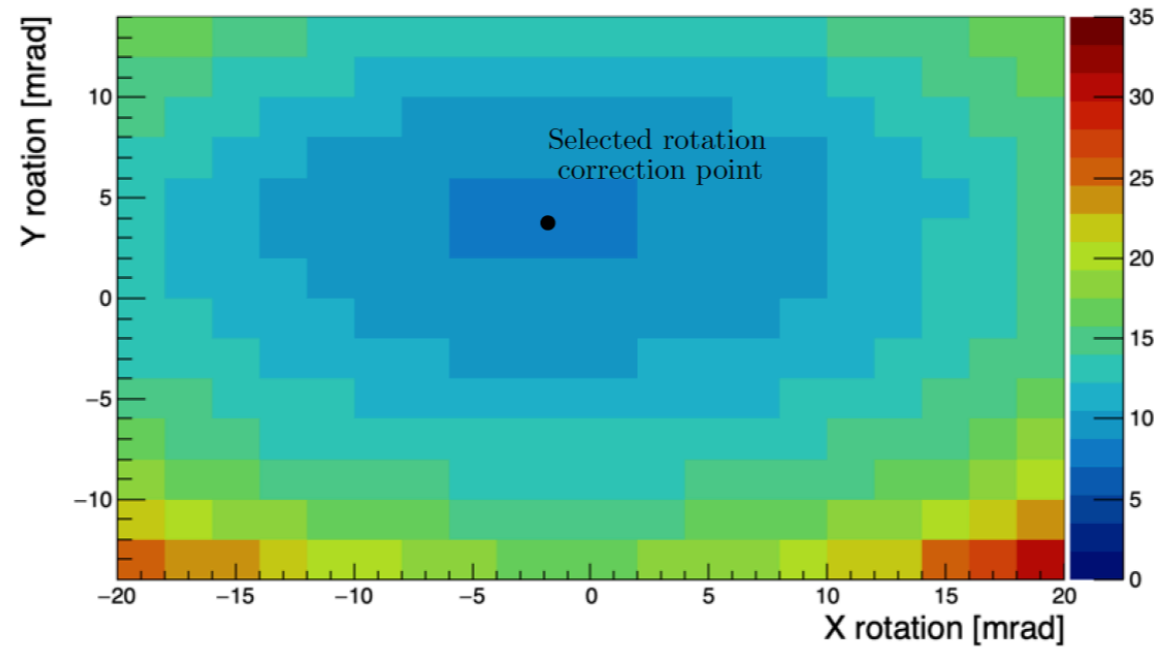


Figure 2.16: Difference between measured and expected  $\theta_C$ , for pions at bar number 7 at the central region of the DIRC wall identified through the  $\rho$  reaction at momentum range 3-3.5 GeV/ $c$ . The Cherenkov angle distribution for direct photons (blue), reflected photons (red) and both (black).

# Momentum Correction

(a) Momentum correction north optical box



(b) Momentum correction south optical box

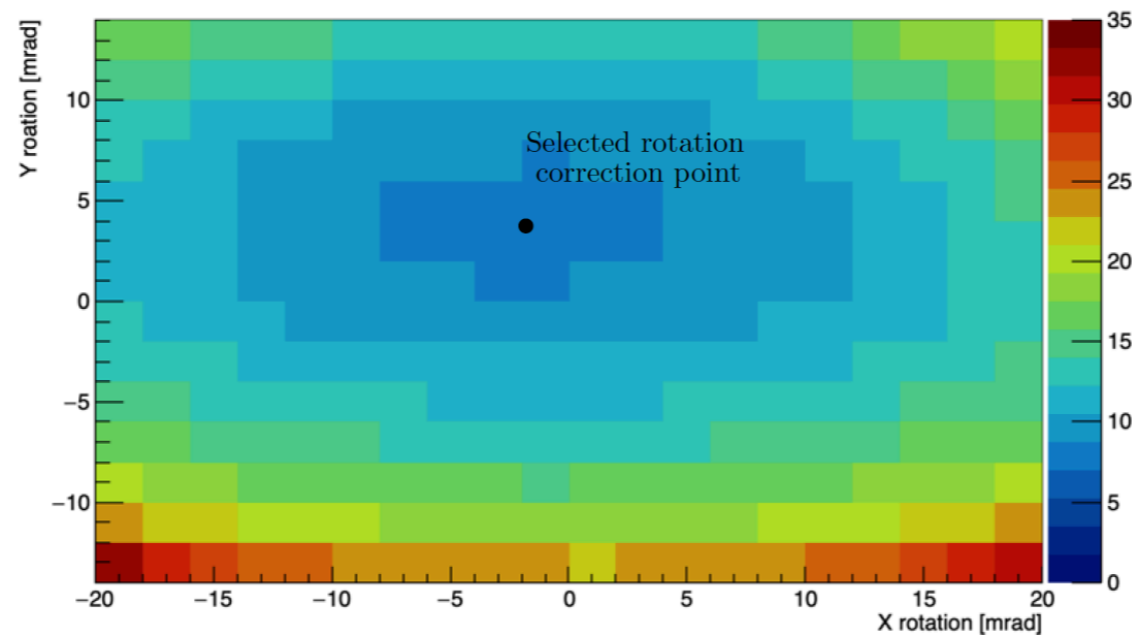


Figure 2.17: Single Photon Resolution (SPR) map as a function of pions momentum rotations, the pions identified through the  $\rho$  reaction at momentum range 3-3.5 GeV/c at the central region of the DIRC wall, the color scale corresponds to the SPR value, (a) SPR Map for all bars on the north optical box (b) SPR Map for all bars on the south optical box. The black dots indicates the selected rotation point.

# Cherenkov Angle Shift

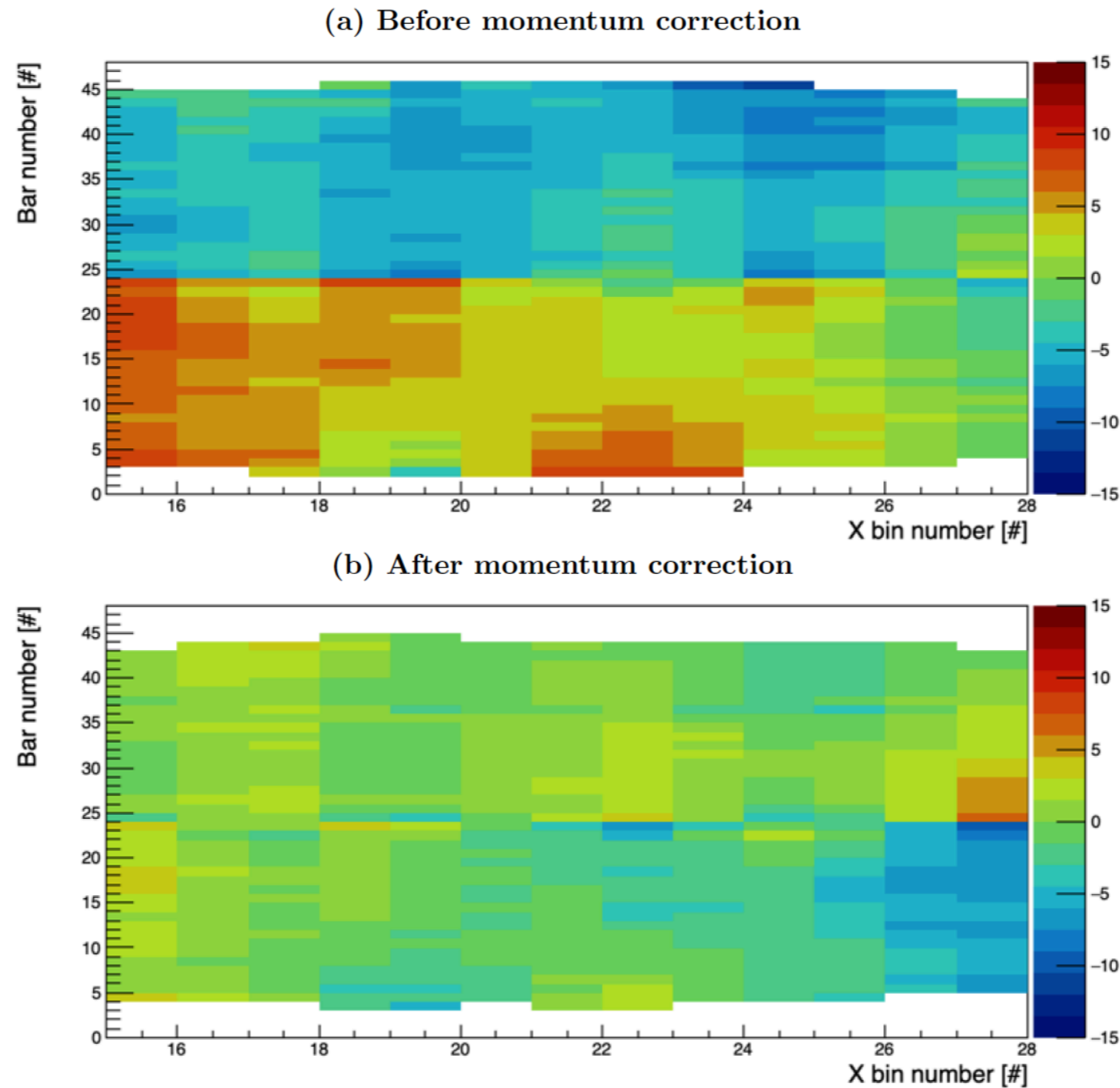


Figure 2.18: Difference between measured and expected  $\theta_C$ , for pions at the central region of the DIRC wall identified through the  $\rho$  reaction at momentum range 3-3.5 GeV/c. The color scale corresponding to the shift magnitude in mrad. (a) before applying momentum correction and (b) after applying momentum correction.

# Pion/Kaon Separation

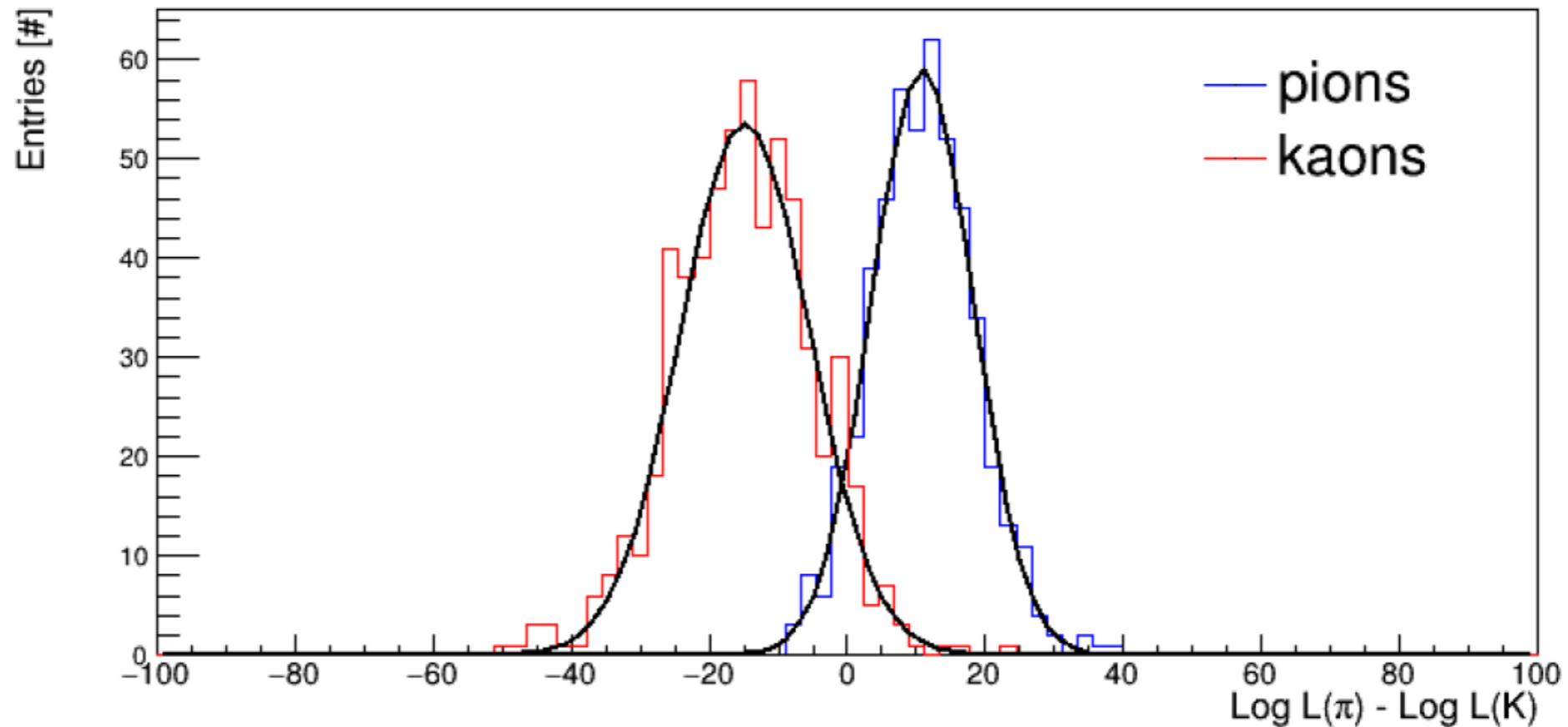


Figure 2.19:  $\pi/k$  log-likelihood difference distributions for kaon hypothesis (red) and pion hypothesis (blue) beam events as result of the geometrical reconstruction at 2.8-3.4 GeV/ $c$  momentum at the central region of the DIRC wall, The  $\pi/K$  separation power value is 3 s.d..

# Pion/Kaon Separation

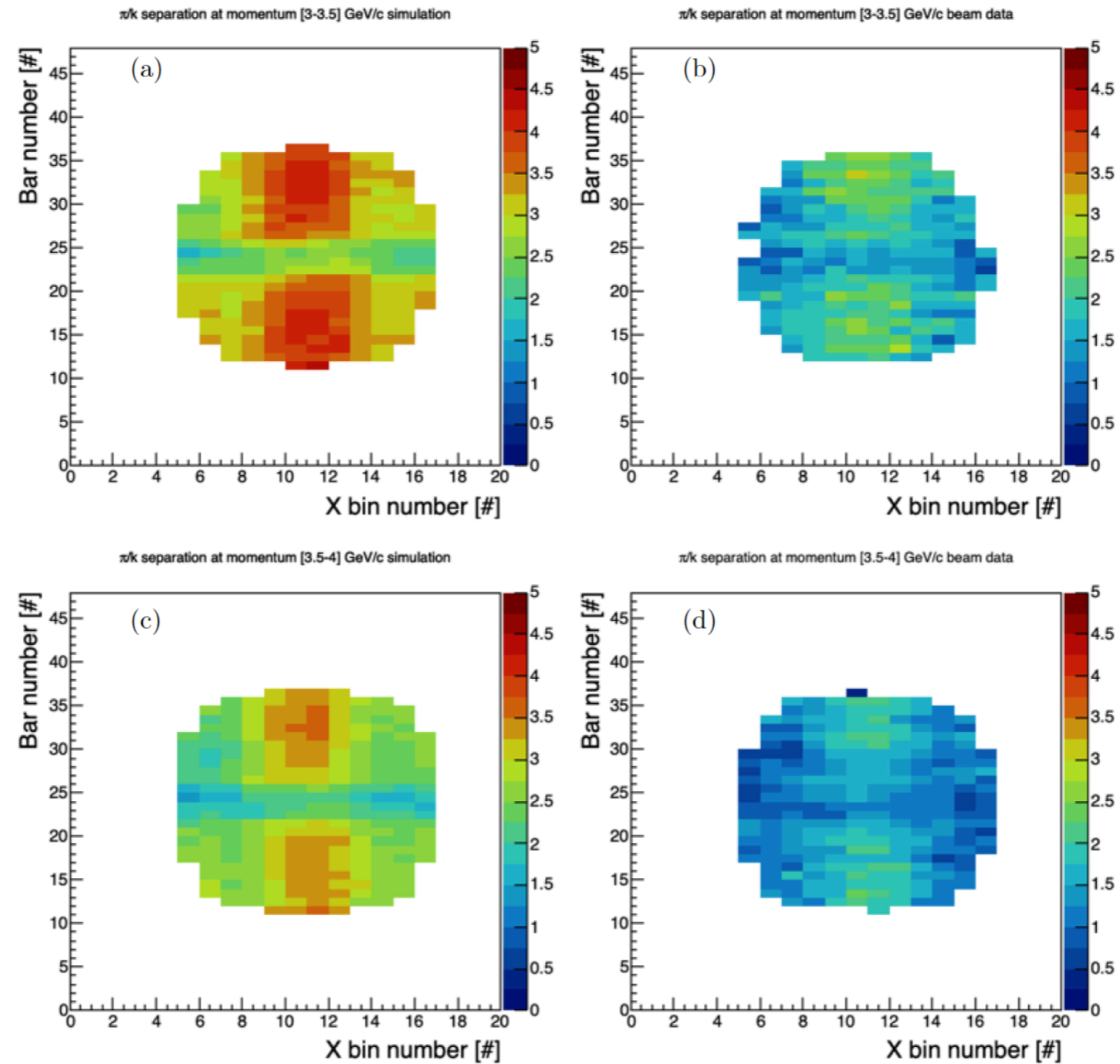
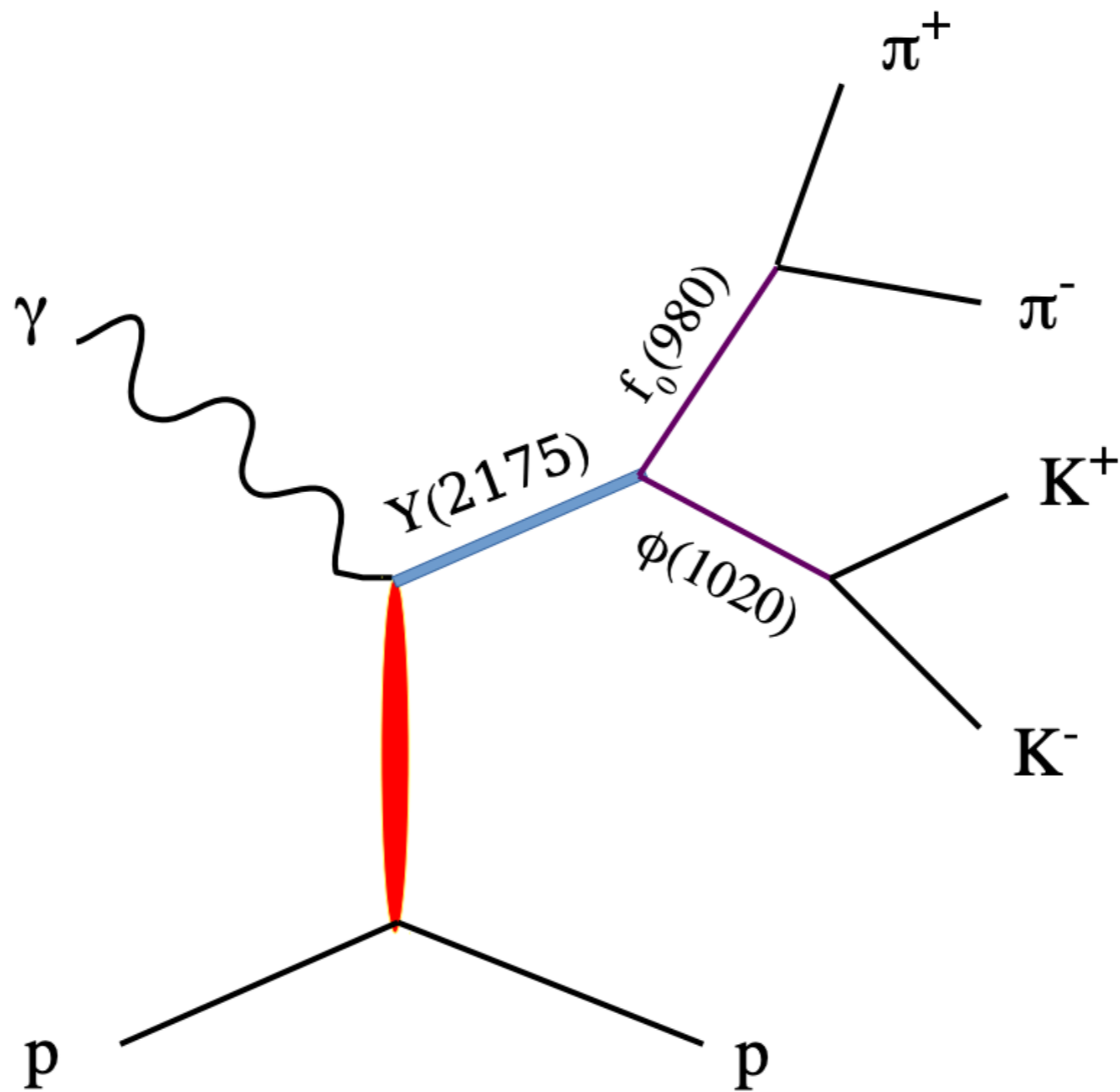


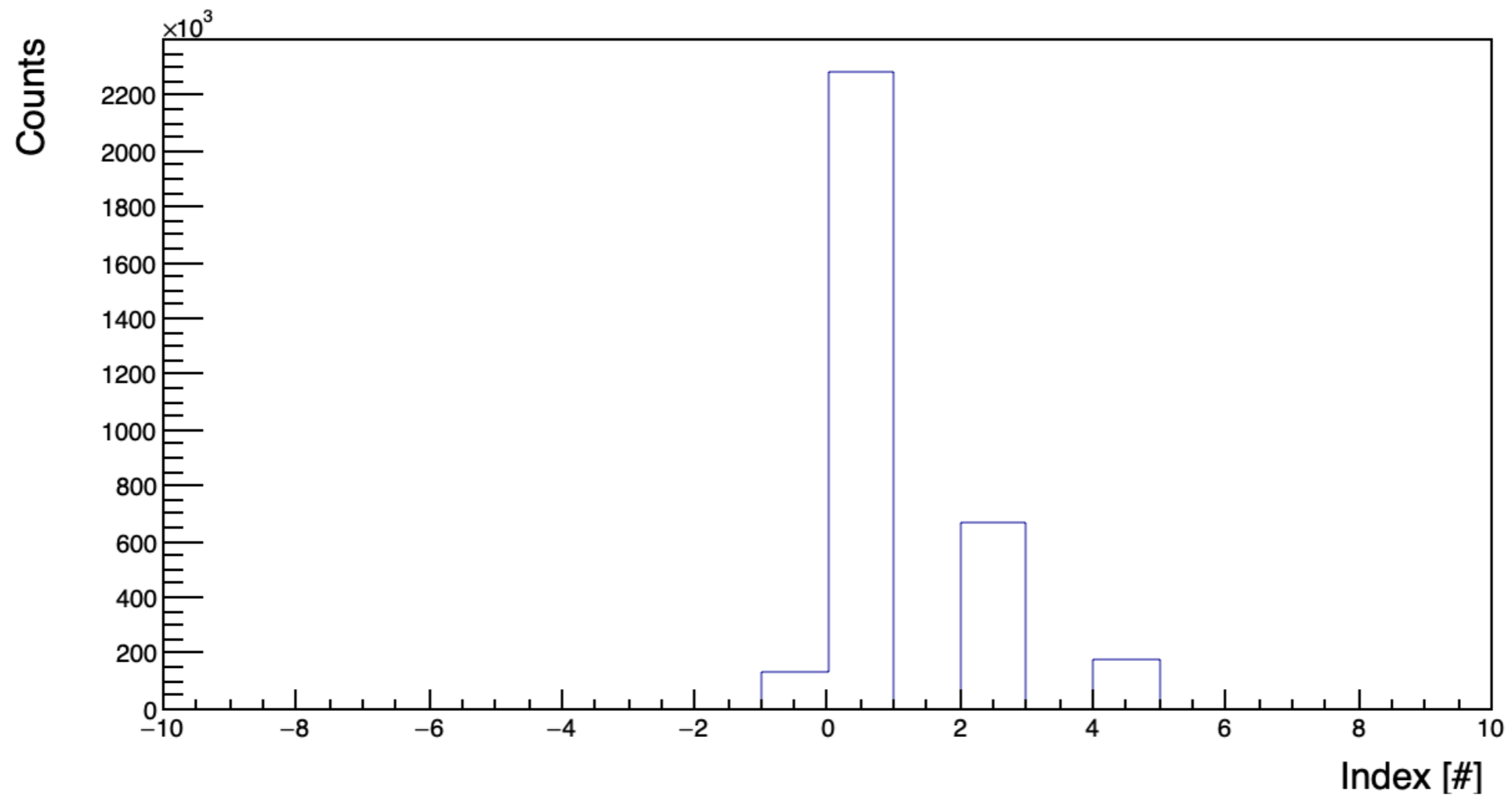
Figure 2.20: pion/kaon separation power maps identified through the  $\rho$  and  $\phi$  reactions. (a) Simulation at momentum between 3-3.5 GeV/c, (b) Beam data at momentum between 3-3.5 GeV/c, (c) Simulation at momentum between 3.5-4 GeV/c and (d) Beam data at momentum between 3.4-4 GeV/c.



# DIRC Application







# Next Step

- Add the background to the MC sample, to see how the DIRC will suppress the background