

GlueX DIRC Commissioning Analyses

A.A

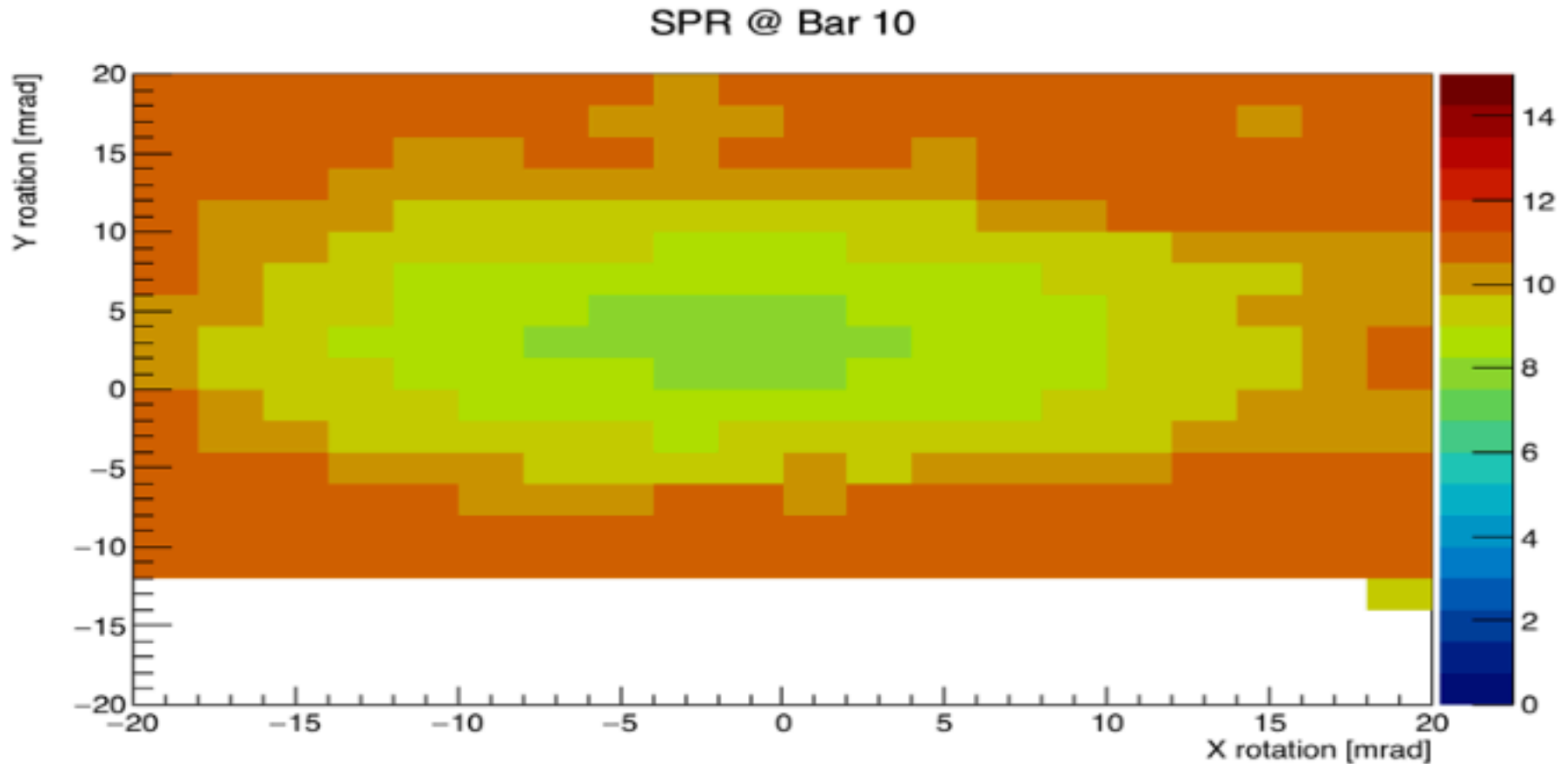
8 Aug 2019

GlueX DIRC Meeting

Outline

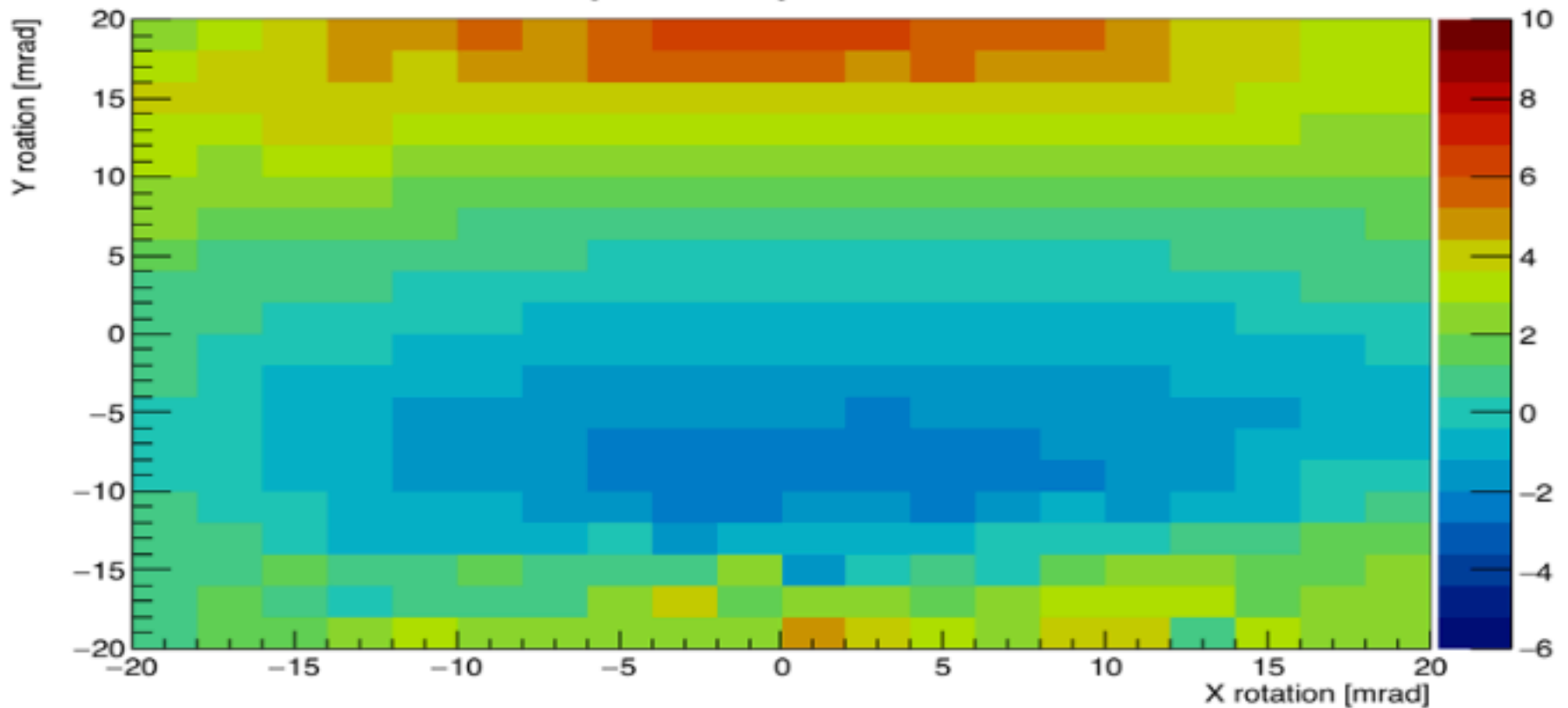
- Momentum Direction Correction (Best SPR method)
- Correction Comparisons
 - Cherenkov Shift (D/R/All)
 - Correlation between photon time and Cherenkov Shift
 - SPR (D/R/All)
 - Correlation between photon time and SPR
- Next Step

Per track SPR



Per track Cherenkov Shift

Mean Value of $\theta_c^{\text{Measured}} - \theta_c^{\text{Expected}}$ distribution @ Bar 6



Animations

-  [Momentum rotation \(Best SPR Method\)](#)

http://web-docs.gsi.de/~aali/ahmeddirc/pages/glx_corr_mom.html

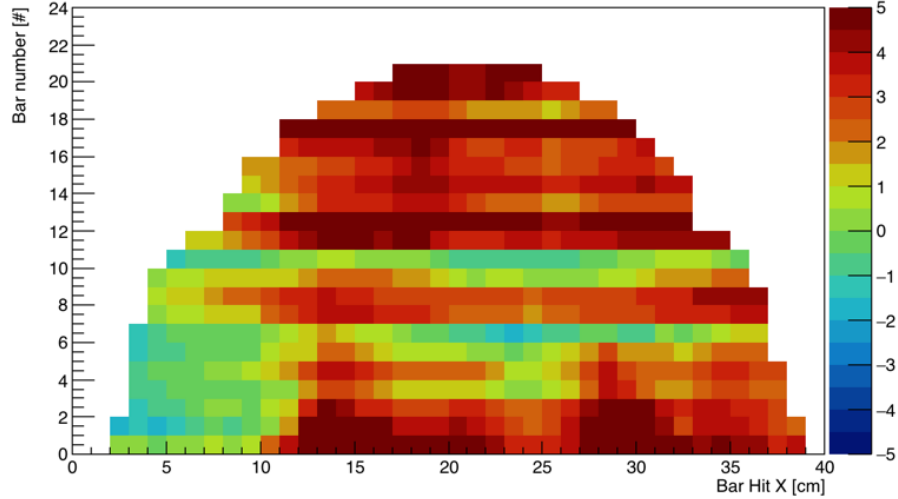
-  [Comparision between Survay & Momentum direciton rotation](#)

<http://web-docs.gsi.de/~aali/v2.mp4>

<http://web-docs.gsi.de/~aali/v3.mp4>

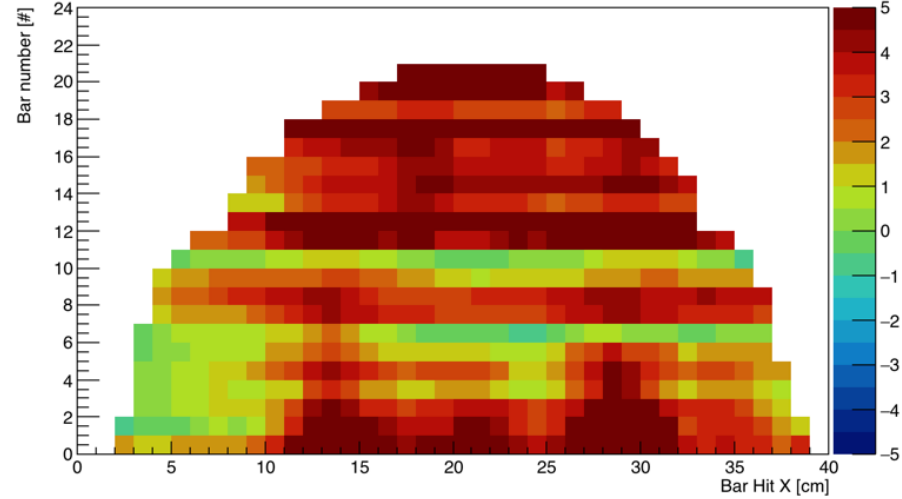
Shift Survey Correction Study

θ_c Shift [mrad]



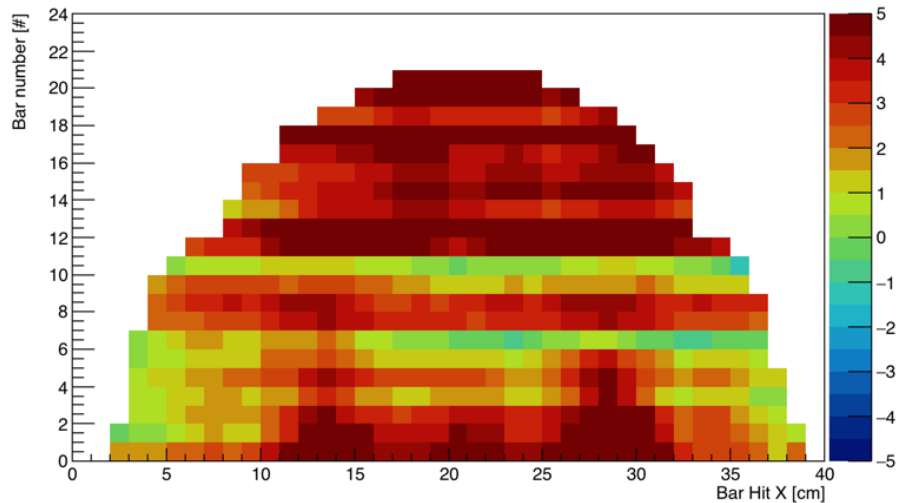
without correction

θ_c Shift [mrad]



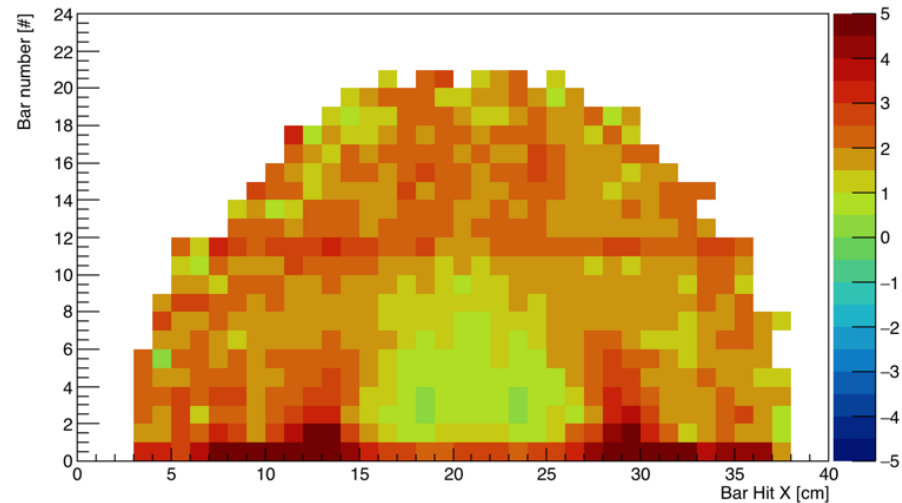
survey correction

θ_c Shift [mrad]



Momentum rotation correction

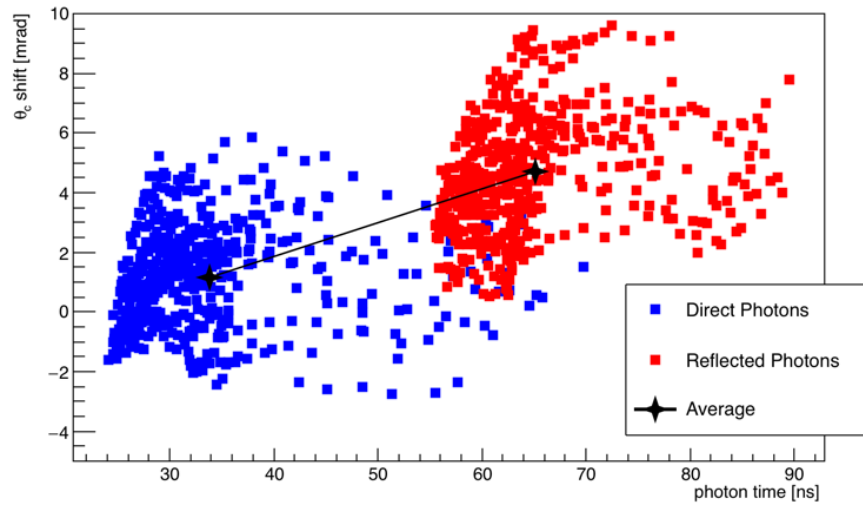
θ_c Shift [mrad]



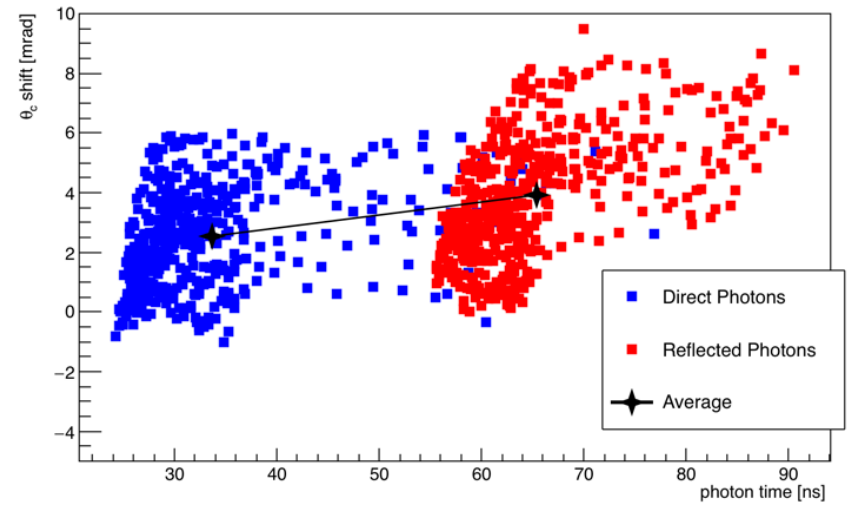
Geant4 simulations

Cherenkov Shift vs photon time

correlation between cherenkove shift and photon time

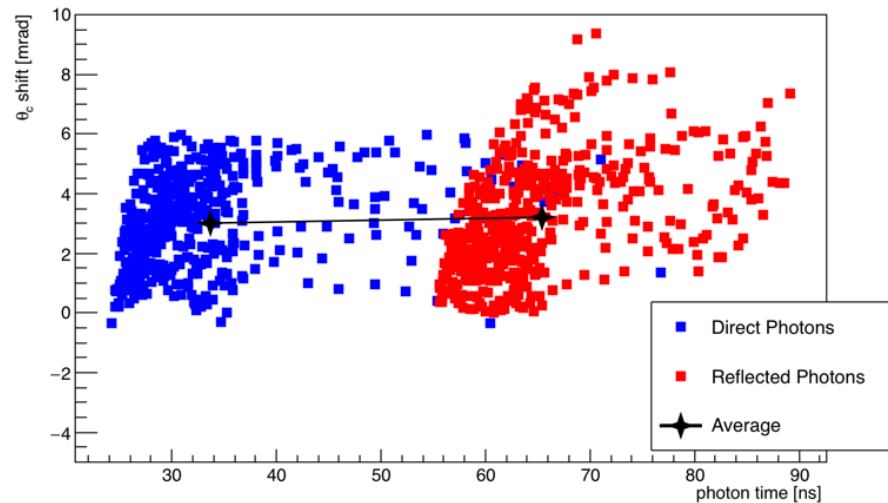


correlation between cherenkove shift and photon time



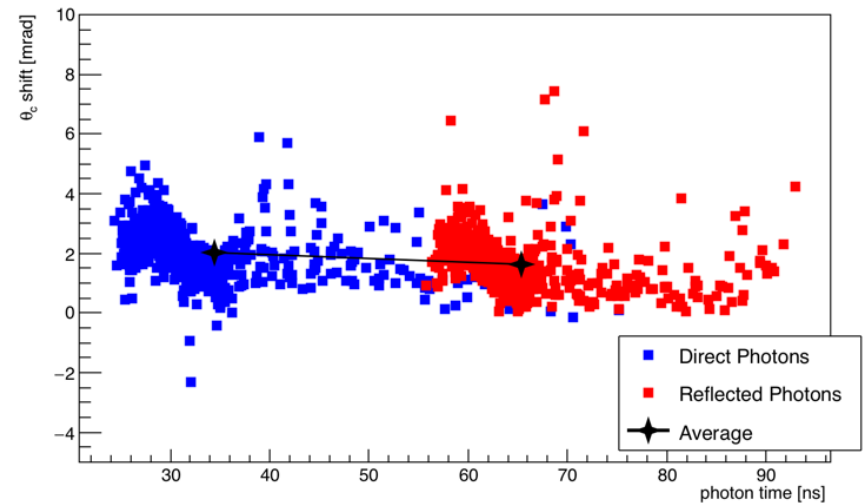
without correction

correlation between cherenkove shift and photon time



survey correction

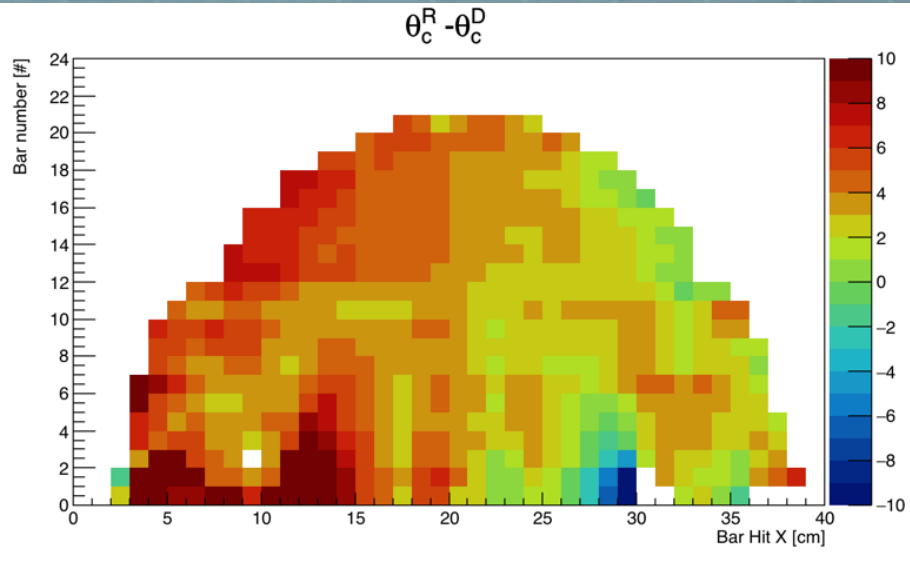
correlation between cherenkove shift and photon time



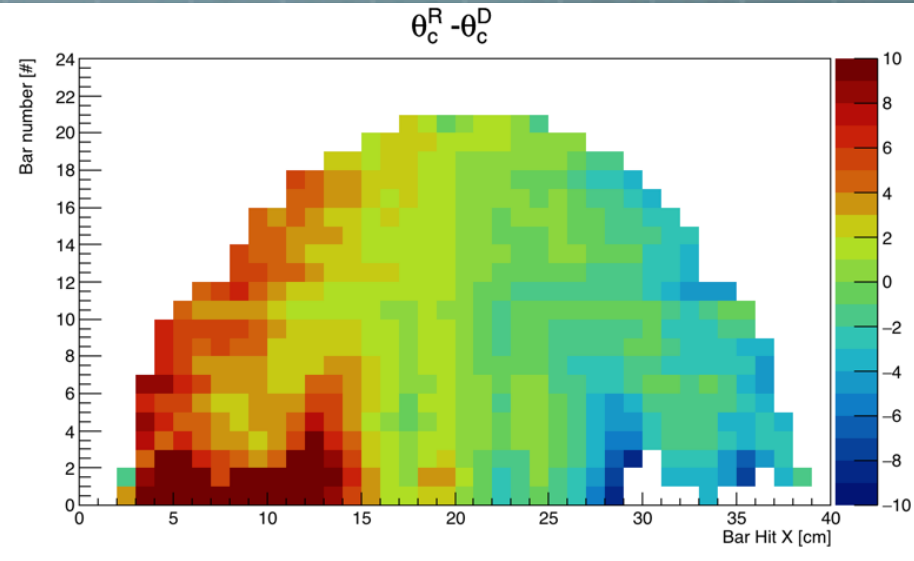
Momentum rotation correction

Geant4 simulations

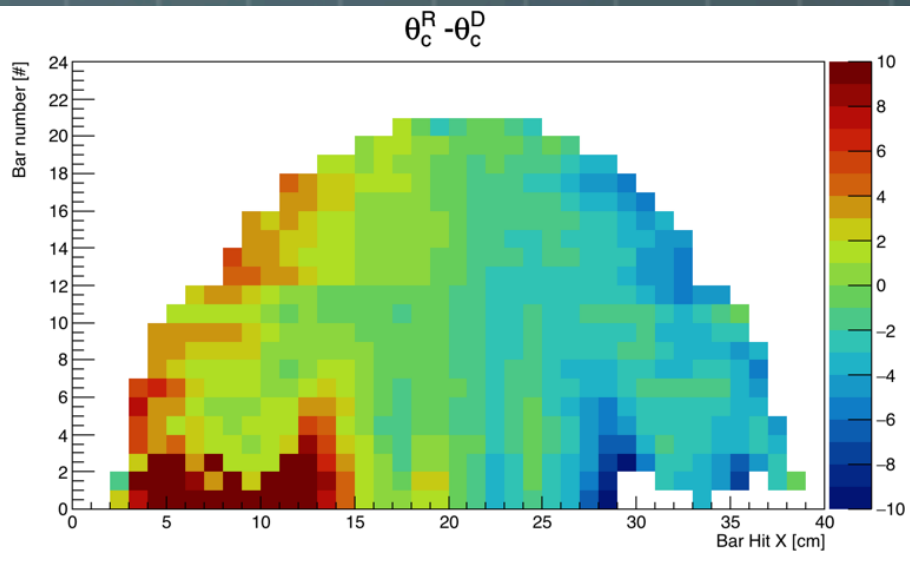
Cherenkov Reflected - Direct



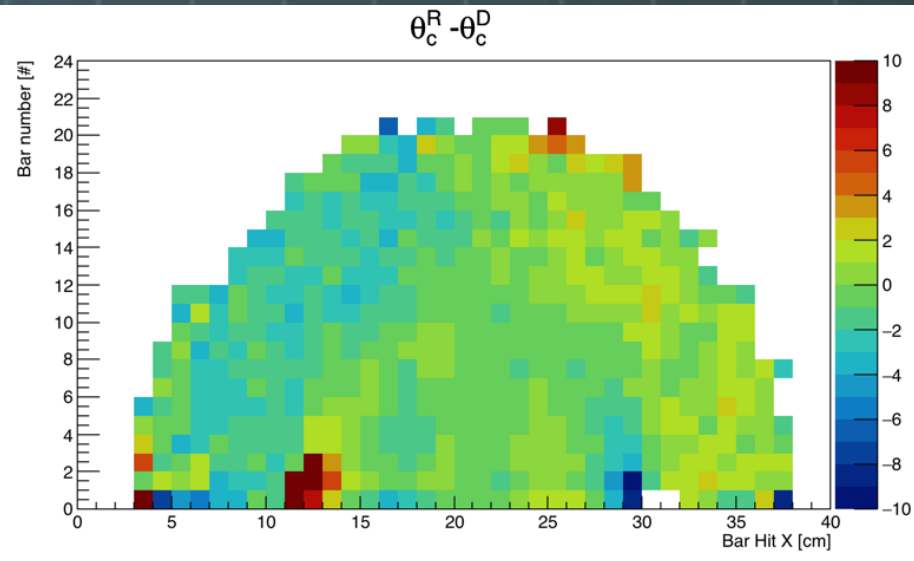
without correction



survey correction

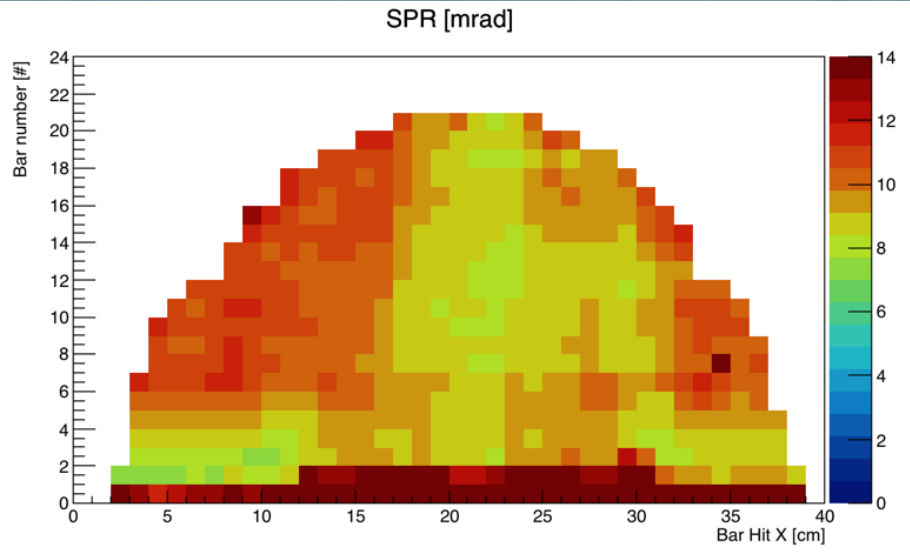


Momentum rotation correction

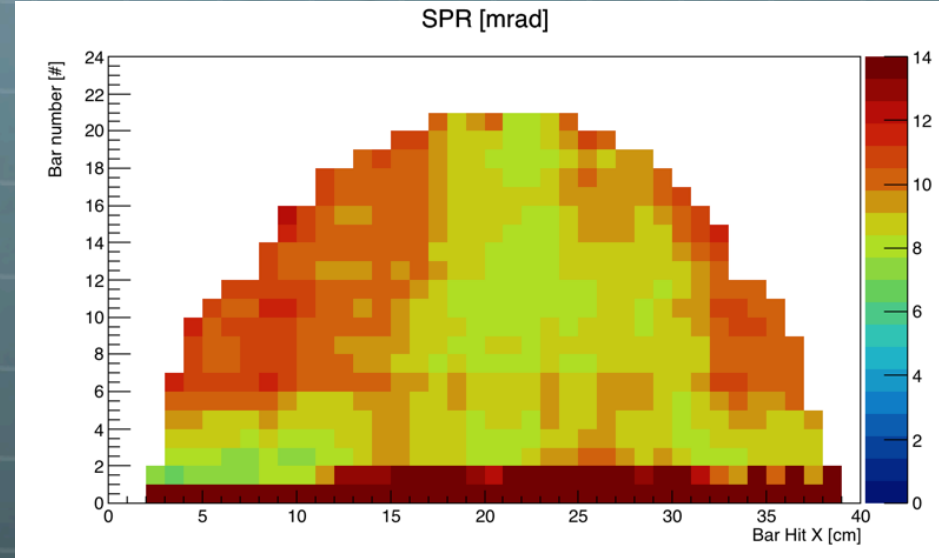


Geant4 simulations

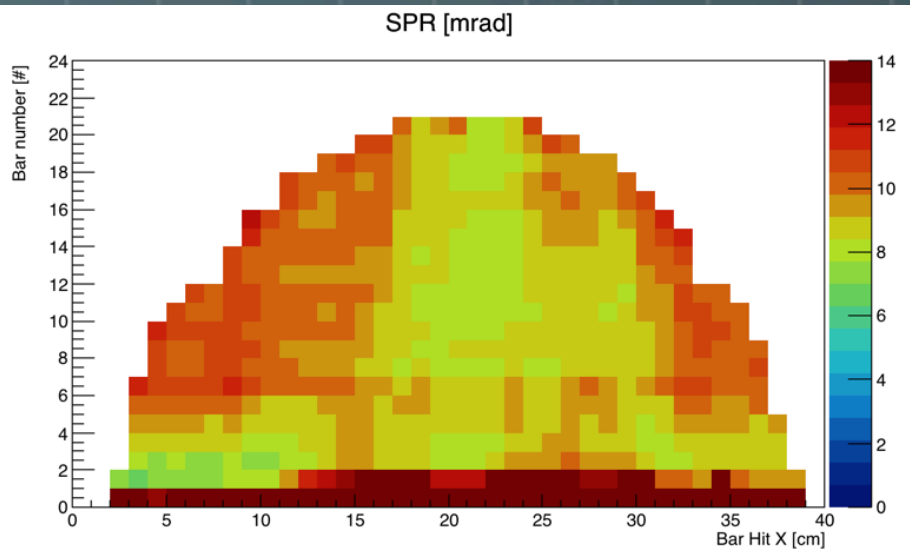
SPR Survey Correction Study



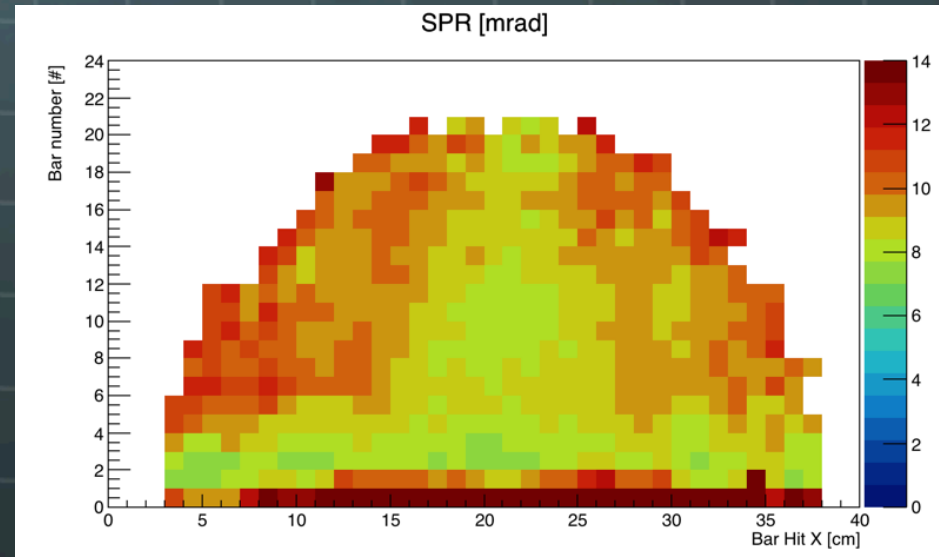
without correction



survey correction



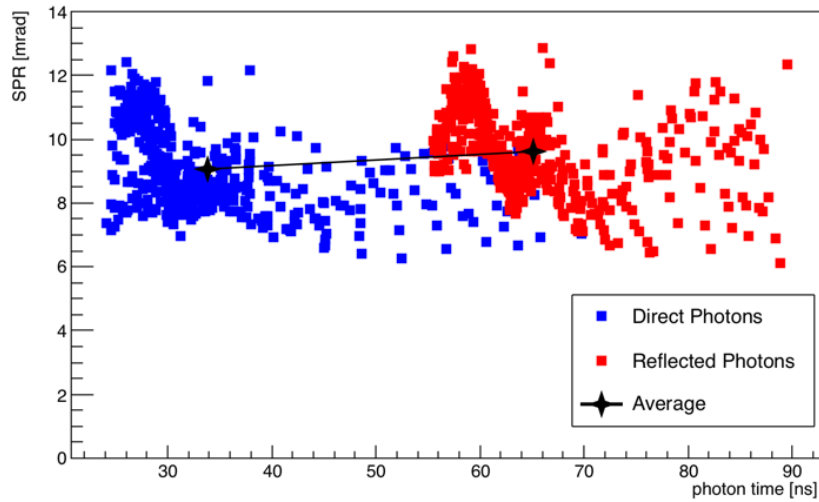
Momentum rotation correction



Geant4 simulations

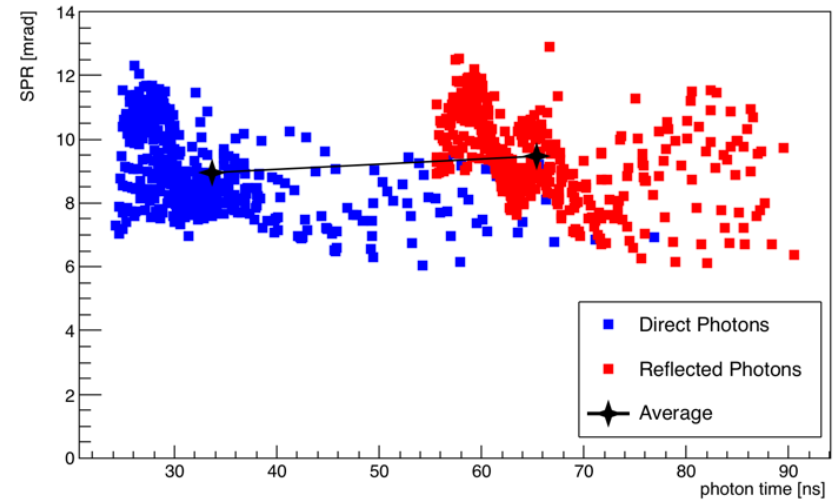
SPR & Photon Time

correlation between SPR and photon time



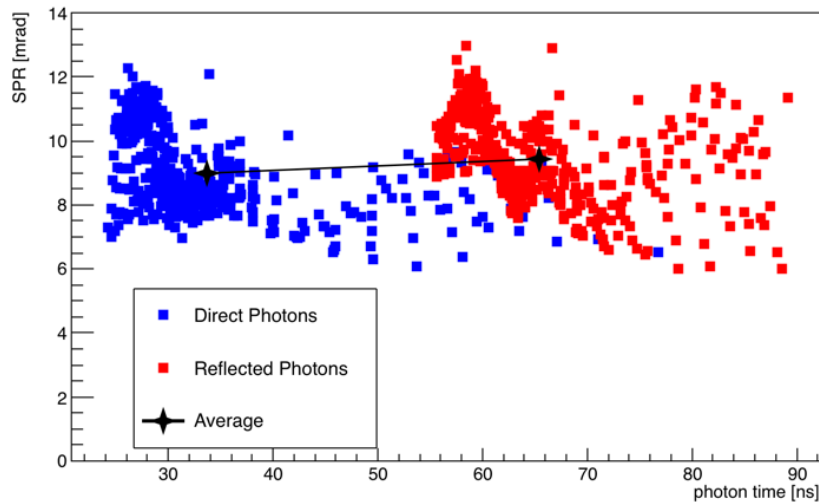
without correction

correlation between SPR and photon time



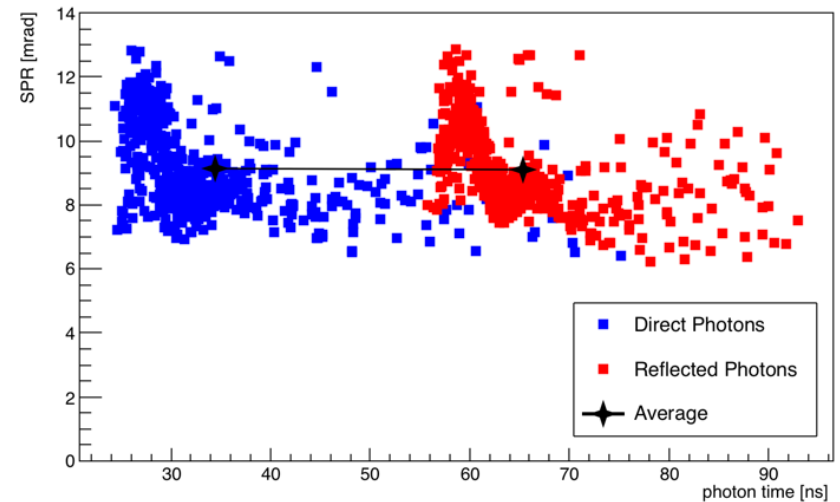
survey correction

correlation between SPR and photon time



Momentum rotation correction

correlation between SPR and photon time



Geant4 simulations

Next Steps

- 🌐 Apply Cherenkov angle Correction [per Bar per X bin per Direct/Reflected flag] since no correlation between the shift neither (yield nor SPR nor momentum)
- 🌐 Calculate Separation power
- 🌐 Calculate Tracking Resolution Map