



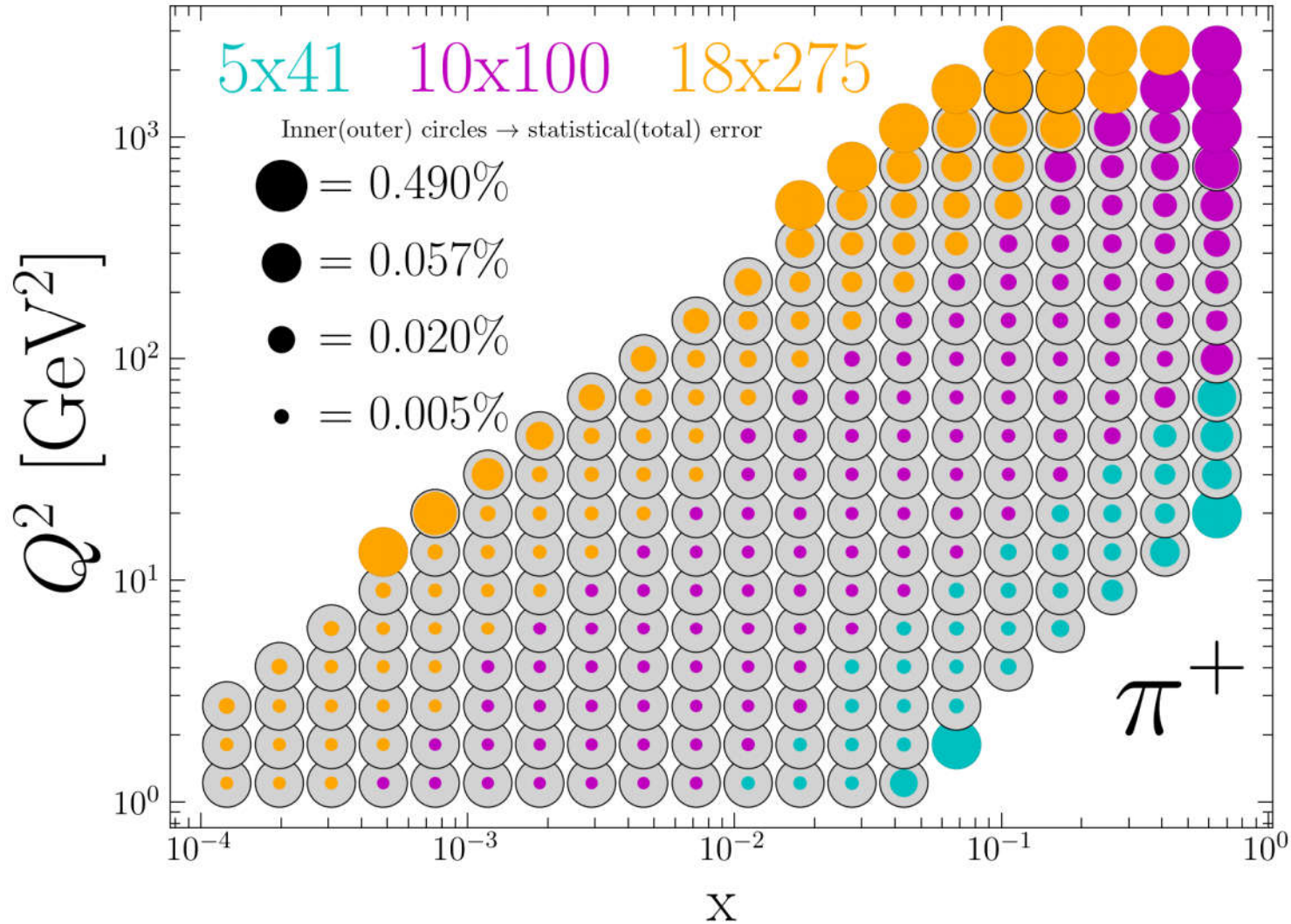
08 / 30 / 2024



SIDIS Working Group

TDR plot 1: Expected uncertainty of Unpolarized TMD PDFs

plot by: Gregory Matousek





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For each energy configuration record the expected experimental luminosity (L_{EXP})

5x41 --> 2.86 [fb⁻¹] 10x100 --> 51.3 [fb⁻¹] 18x275 --> 10 [fb⁻¹]

Count the total number of generated Monte Carlo events (N_{GEN})

Record the total cross section of the Monte Carlo simulation ($XSEC_{GEN}$)

5x41 --> 485730 [picobarns] for $Q^2 > 1 \text{ GeV}^2$

10x100 --> 555660 [picobarns] for $Q^2 > 1 \text{ GeV}^2$

18x275 --> 741670 [picobarns] for $Q^2 > 1 \text{ GeV}^2$

Calculate the generated luminosity ($L_{GEN} = N_{GEN} / XSEC_{GEN}$)

Select events with a scattered electron and at least 1 pion reconstructed

$W > 3 \text{ GeV}$ $Q^2 > 1 \text{ GeV}^2$ $0.05 < y < 0.95$ $0.05 < z < 0.95$ $p_T > 0.1 \text{ GeV}$

Count the total number of reconstructed pions (N_{REC})

Scale to the expected number of reconstructed pions by ($N_{EXP} = N_{REC} * L_{EXP} / L_{GEN}$)

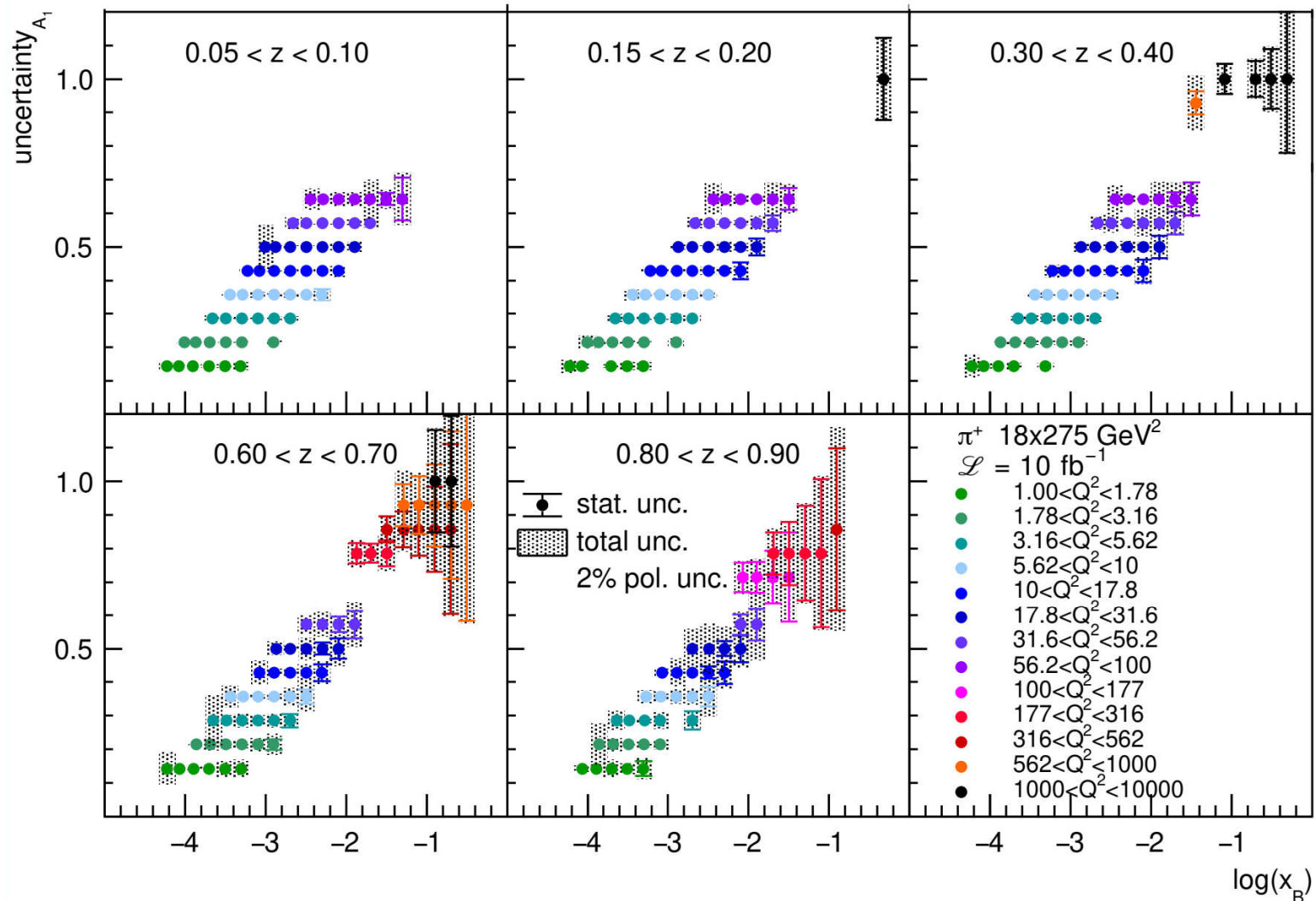
Once we have N_{EXP} binned in (x, Q^2) for each energy configuration, we select the color on the plot based on the energy configuration with the largest N_{EXP} in that bin.



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TDR plot 2: Statistical and total uncertainty of A_{LL} of π^+ for helicity PDFs

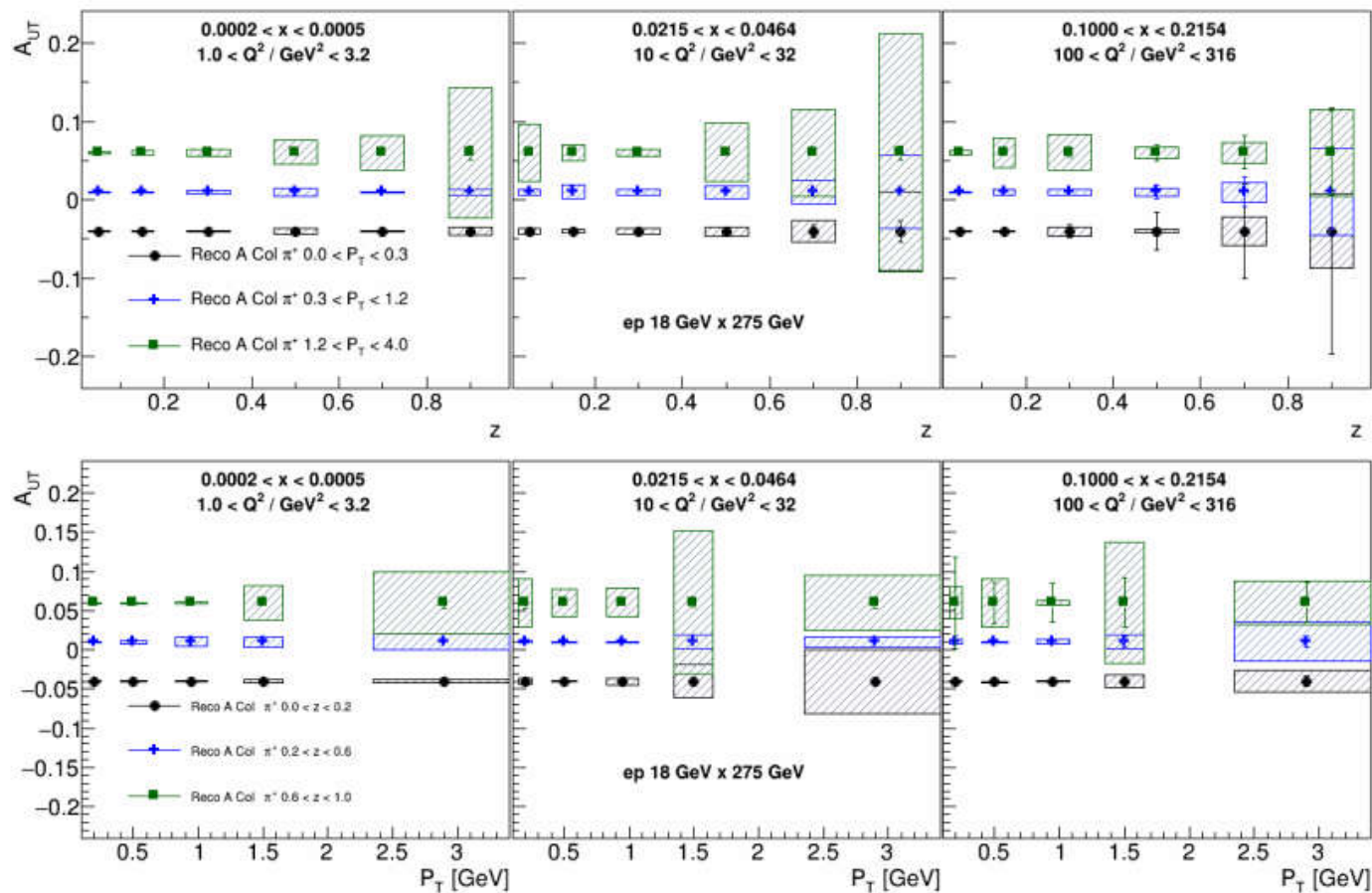
plot by: Charlotte van Hulse



updates with the newest simulation version ongoing ...

TDR Plot 3: A_{UT} for polarised TMD PDFs

plot based on ECCE by: Ralf Seidl



→ An updated version will be produced

Figure 9: Projected π^+ Collins asymmetry statistical and systematic uncertainties as a function of either z (top panel) in bins of P_T or as a function of P_T in bins of z (bottom panel) for three select x and Q^2 bins. The asymmetries are shown at arbitrary values for better visibility. The statistical uncertainties are extrapolated to an accumulated luminosity of $10\ \text{fb}^{-1}$ for the 18 GeV x 275 GeV energy option. For better visibility either 4 bins in P_T and 2 bins in z were combined or vice versa.