

Discussion Session - Transverse Spin Physics

PacificSpin2019, August 29

Transversity $h_1(x)$

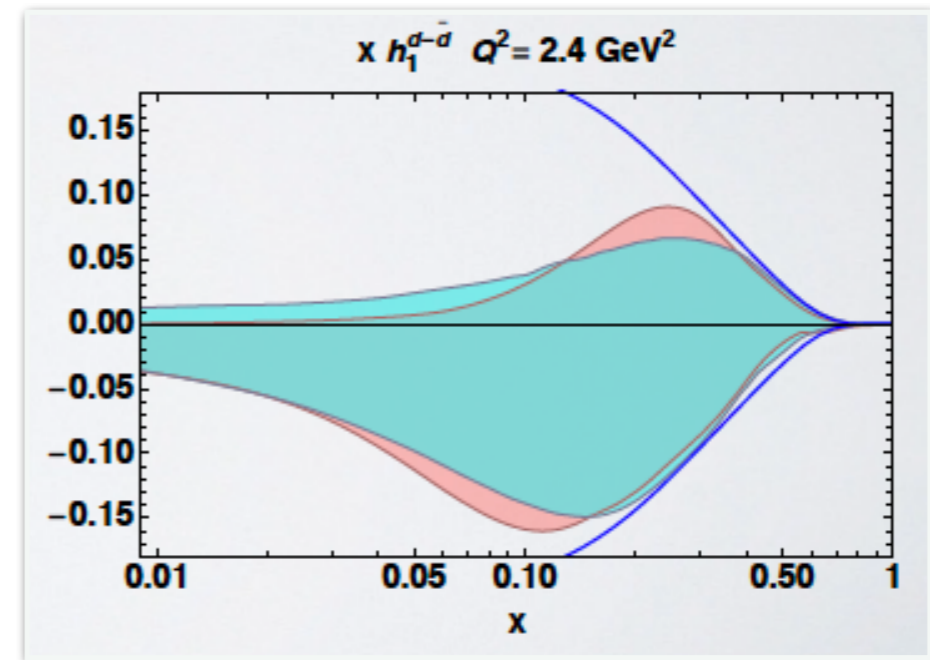
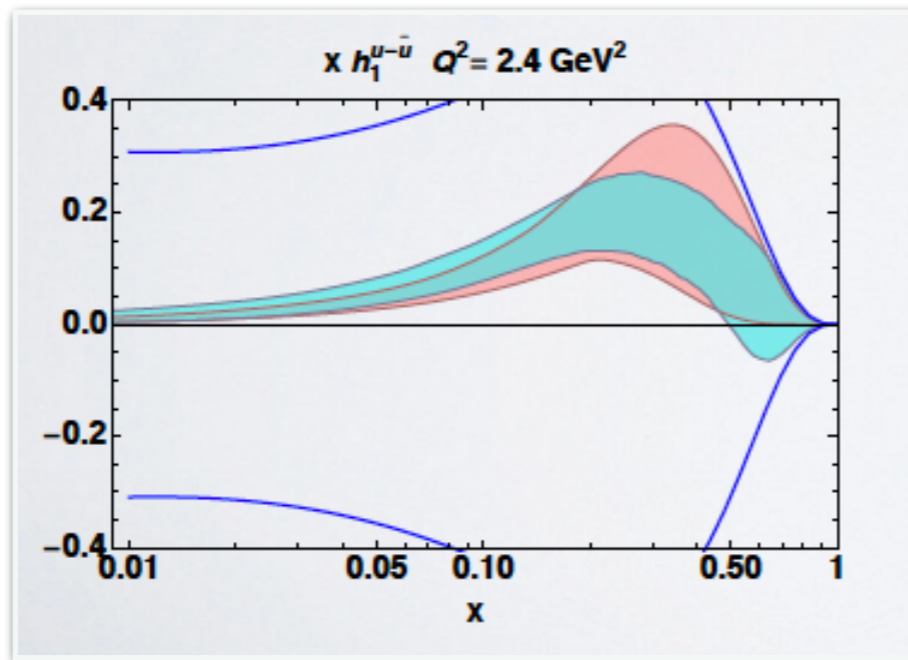
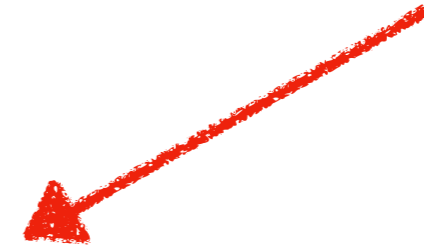
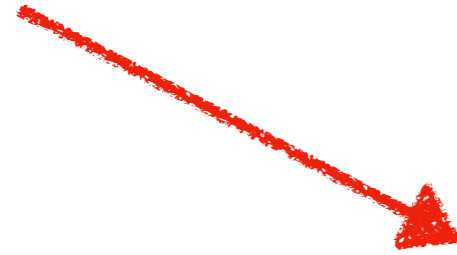
talk by M. Radici

Collins effect (TMD)

Dihadron fragmentation

Lattice?

Lin et al: PRL 120, 152502 (2018)



Tensor charge -> BSM physics

What is needed to improve the fits?

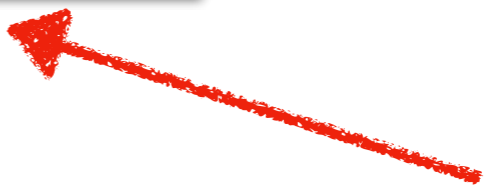
Can Lattice help?

Impact of EIC?

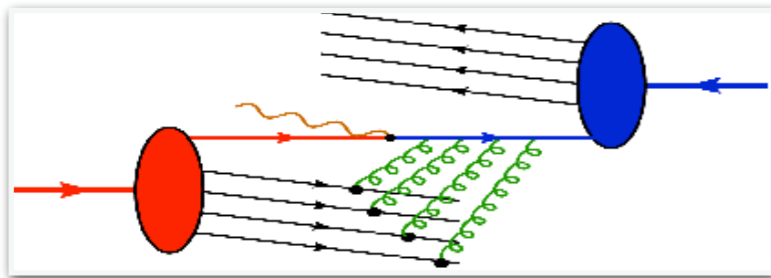
Sivers effect - sign change

COMPASS, SpinQuest talks this morning

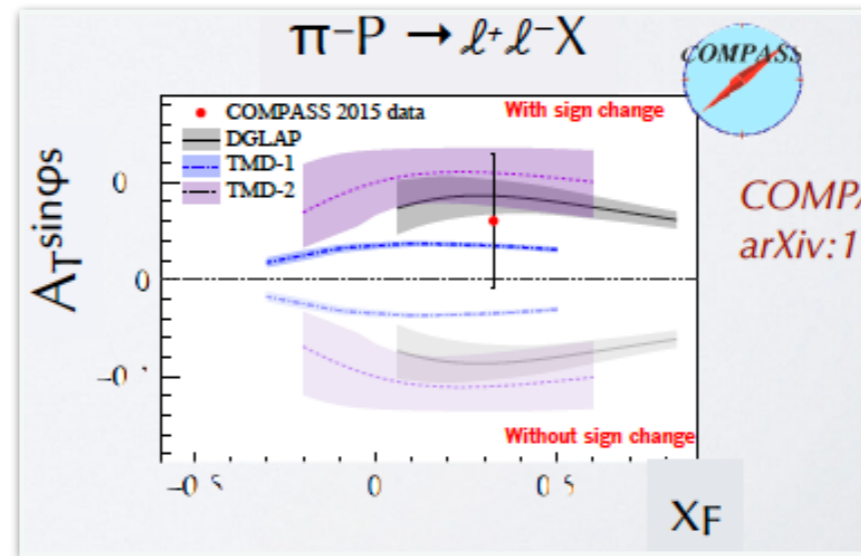
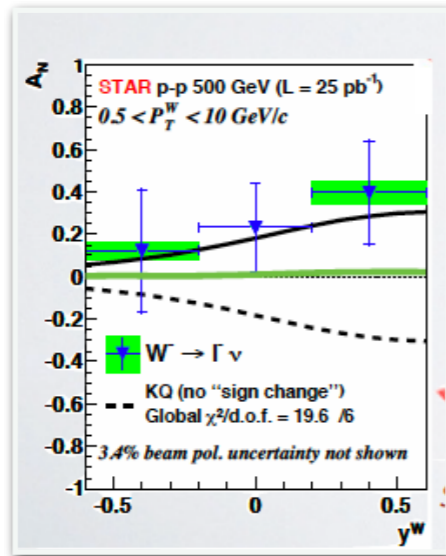
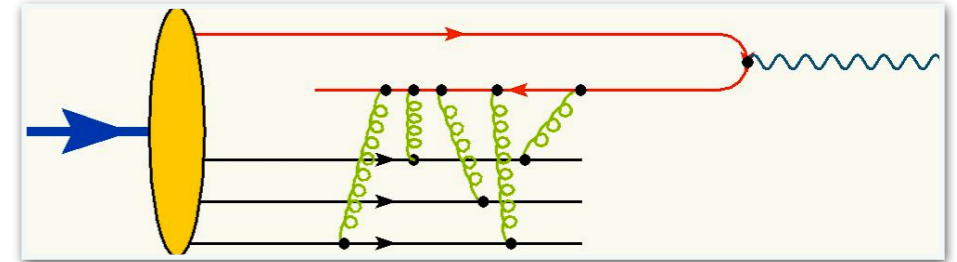
$$f_{1T}^\perp \Big|_{DIS} = -f_{1T}^\perp \Big|_{DY}$$



Initial State Interactions: Drell-Yan



Final State Interactions: SIDIS

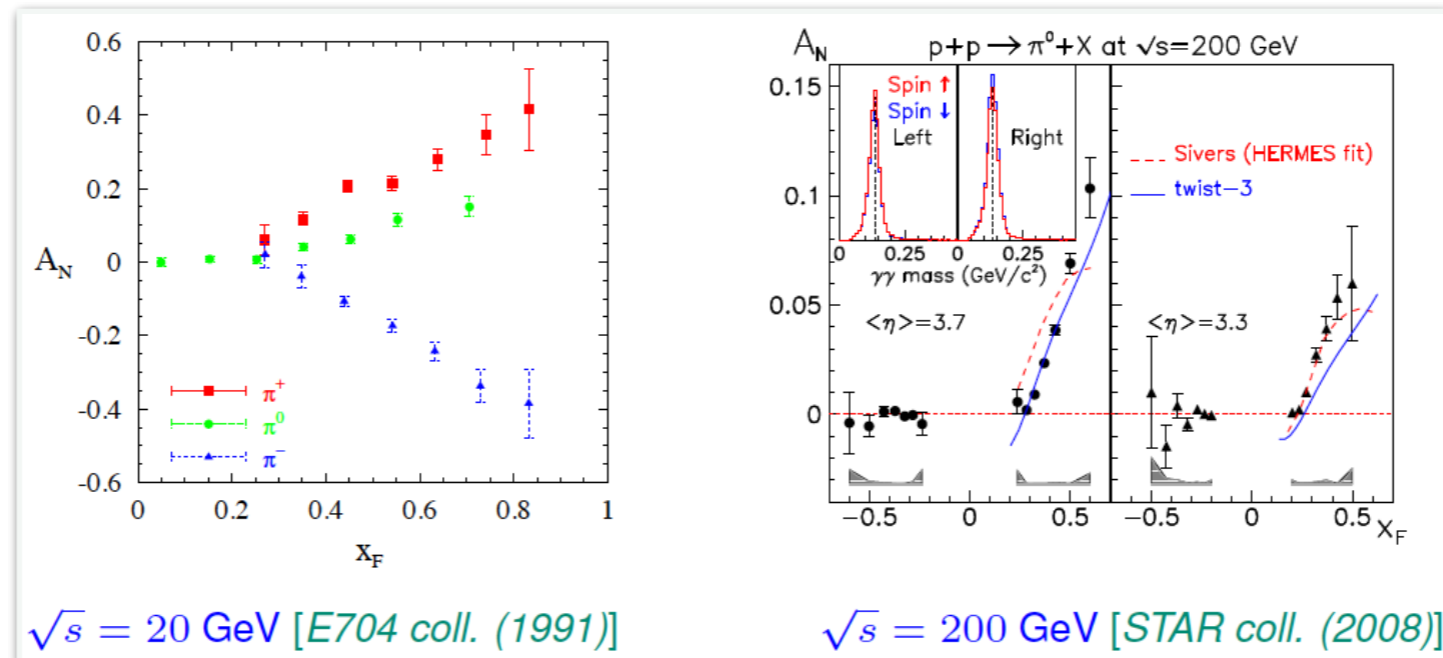


More input to come from COMPASS, FermiLab, RHIC(?)

What precision (experiment, theory) do we need to decide about sign change?

Collinear Twist-3

final goal: understand Transverse SSA at RHIC

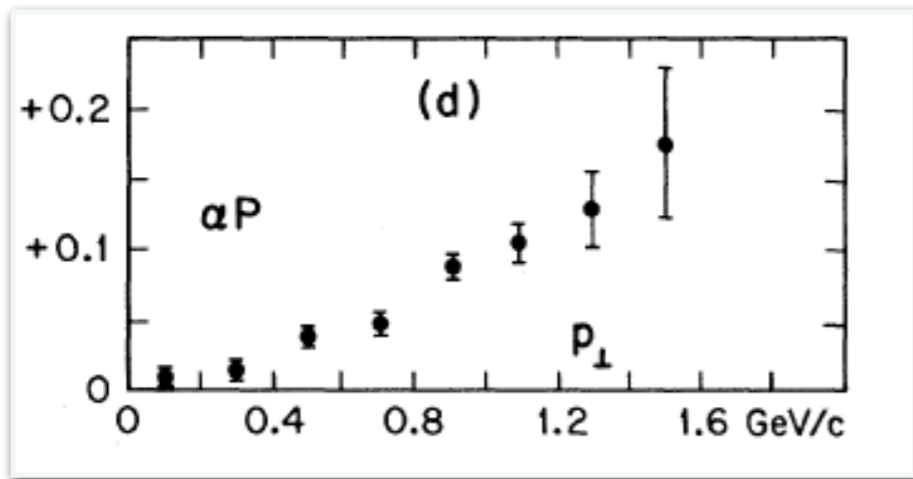


- “understand” to what extent? NLO? Will that ever be doable for pp?
- Theory: there is “unexplored territory”, evolution equations, their numerical implementation
- Important to prove one-loop factorization of collinear twist-3 (exist for “Sivers” SSA in DY, SIDIS). Other cases? “Non-pole” methods?
- EIC: crucial! Where precisely can EIC contribute? Some main measurement?
- g_2 measurements at EIC? possible?
new data from JLab: can we learn something about Quark-Gluon Correlation beyond WW-approximation?

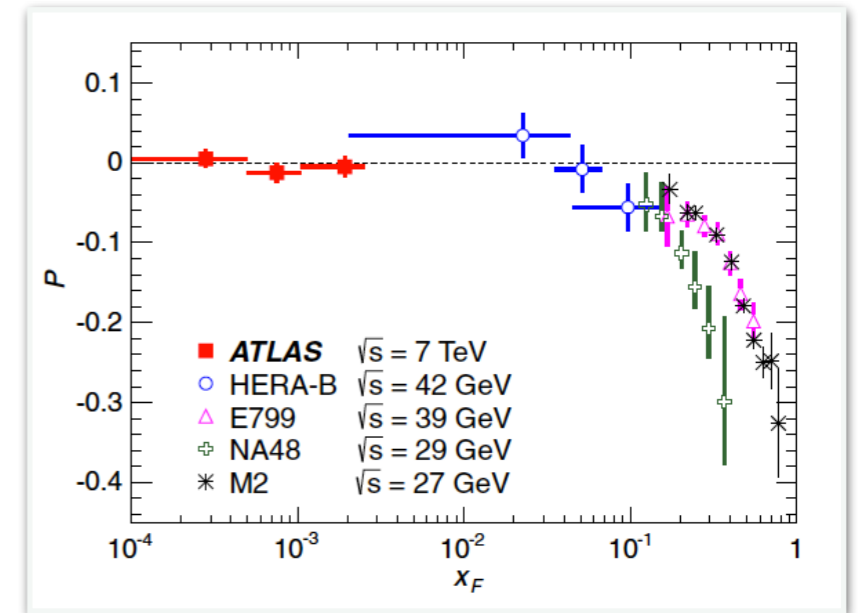
Λ hyperon polarization

Transverse Λ polarization in pA: long history...

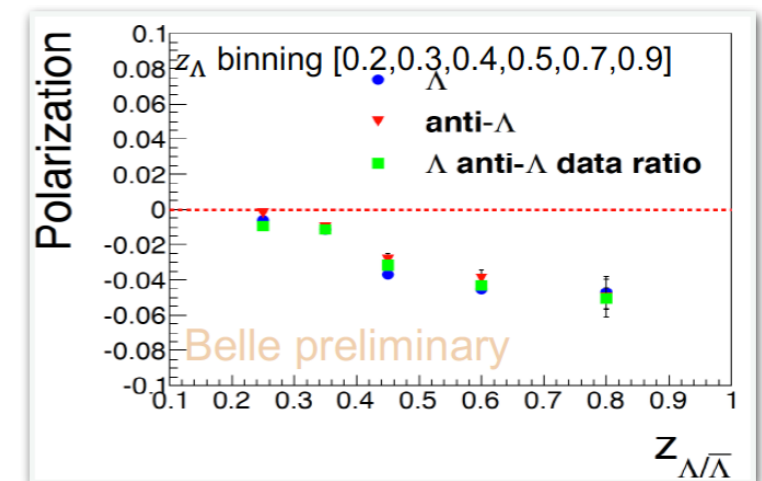
Fermilab (1976): $p+\text{Be} \rightarrow \Lambda^0 + X$



ATLAS (2015) at $\sqrt{s} = 7$ TeV



BELLE: $e^+ e^- \rightarrow \Lambda^{\uparrow} X$



Mechanism: Twist-3 Fragmentation functions?

Can we extract them from BELLE?

What about Longitudinal Λ spin?

What can be done about Λ spin at the EIC?

Can Λ polarization be useful for LHC physics?

Analysis tool in particle physics?