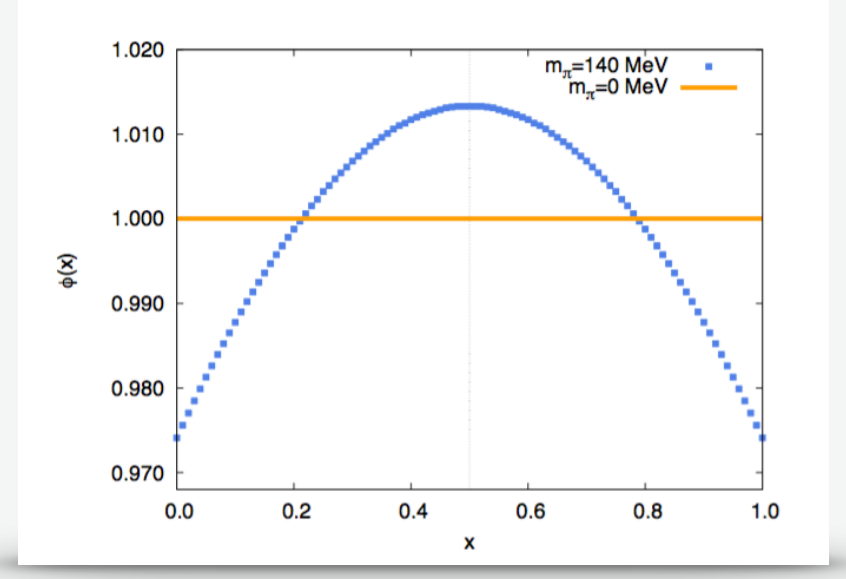
Pion and Kaon Structure in Nambu-Jona—Lasinio

Why NJL?

- Quarks degrees of freedom
- Constituent quarks mass from gap equation
- Pion as a Goldstone mode
- Pion as a Bound-State in the sense of Bethe-Salpeter
- Choice of a covariant regularization scheme



DISTRIBUTION AMPLITUDE

AT Q_0^2

Kaon PDF in Davidson & Ruiz-Arriola, Acta Phys.Polon. B33

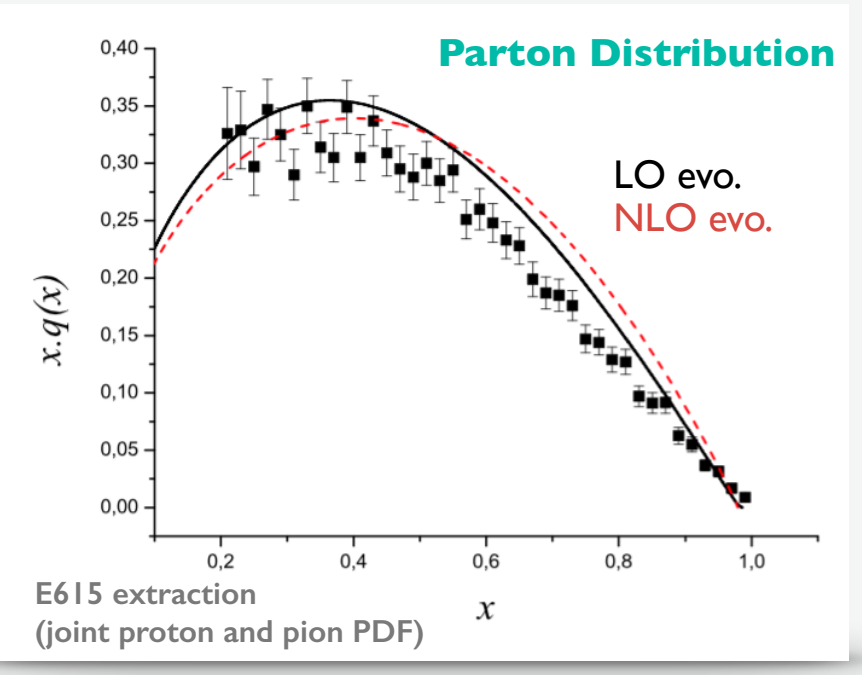
Pion GPD in Theussl et al., Eur.Phys.J. A20

Pion TMD in Noguera & Scopetta, JHEP 1511

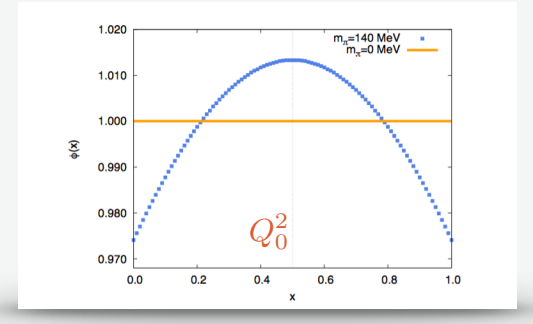
Pion TMD pheno in Ceccopieri et al., Eur.Phys.J. C78

More from Ruiz-Arriola, Broniowski, Gamberg, Noguera, Scopetta, Courtoy,…

Pion and Kaon Structure in Nambu-Jona—Lasinio

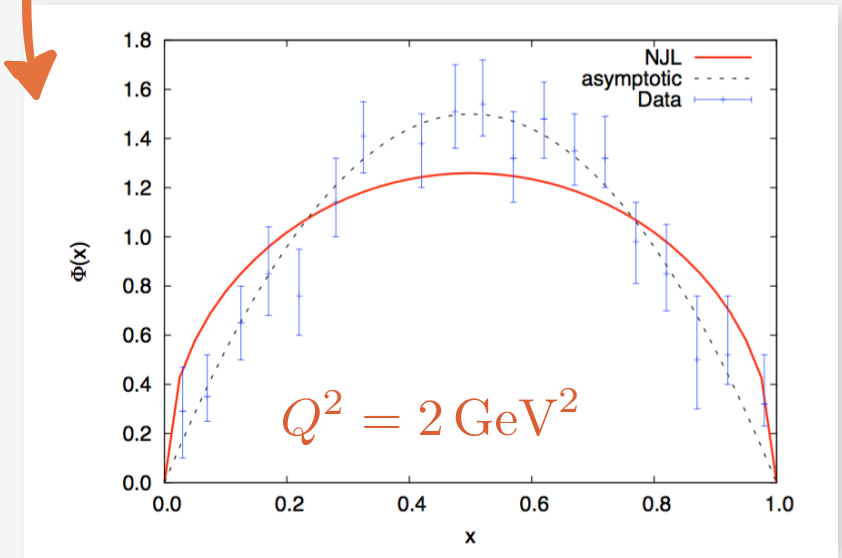


E615 extraction
(joint proton and pion PDF)



Mind the scale of y-axis!

ERBL eqs.



Nambu - Jona-Lasinio (NJL)
with to MSRS PDFs (1992)
DGLAP eqs.

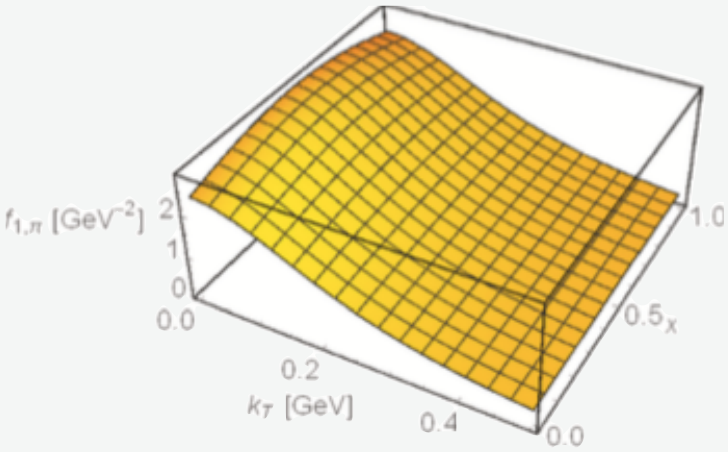
$$Q_0 = 0.29\mathrm{GeV} \quad , \quad \text{for the LO evolution;}$$
$$Q_0 = 0.43\mathrm{GeV} \quad , \quad \text{for the NLO evolution.}$$

$$\Lambda_{\mathrm{LO}} = 0.174\,\mathrm{GeV}$$
$$\Lambda_{\mathrm{NLO}} = 0.246\,\mathrm{GeV}$$

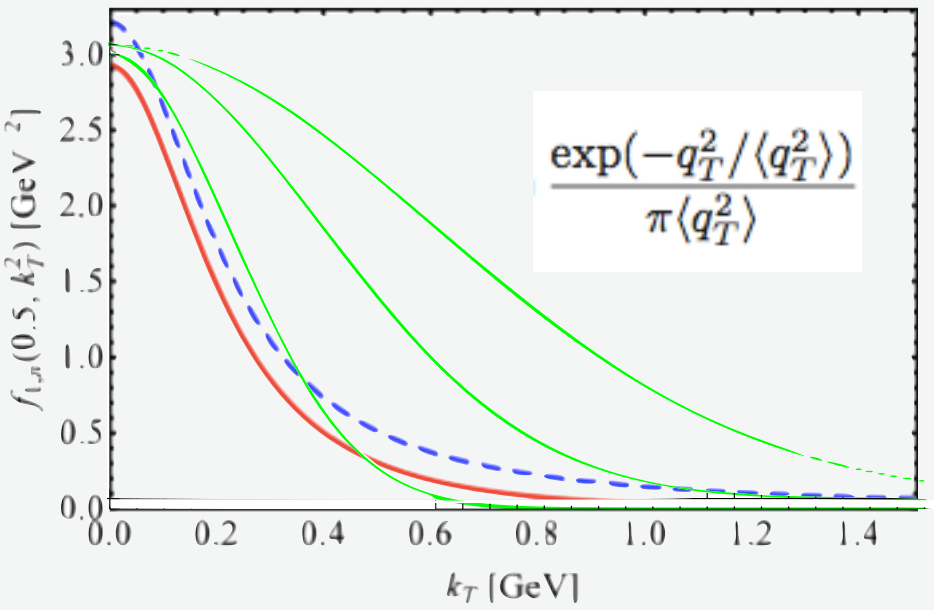
Another access to Q_0:
Comparison of DY integrated X-section with theory at NLO
(pion from NJL+ proton from CTEQ06M)

→ Q_0=0.46 GeV with χ^2/dof=2 [Eur.Phys.J. C78]

Pion and Kaon Structure in Nambu-Jona—Lasinio



Pion TMD in Noguera & Scopetta, JHEP 1511



Pion dynamics→ differs from a gaussian

Transverse profile→ no dpdce on x or M