

Synopsis for extractions of unpolarized TMDs: SV19

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These notes contains some information on TMD distributions extracted in the fit SV19, and its later updates. The collection is not complete!, and mainly concerne the latest updates.

Reference: Scimemi:2019cmh

I. Scimemi and A. Vladimirov,

“Non-perturbative structure of semi-inclusive deep-inelastic and Drell-Yan scattering at small transverse momentum,”

JHEP **06** (2020), 137 doi:10.1007/JHEP06(2020)137

Required `artemide` version: >2.04

For the detailed description of the non-perturbative model see sec.2 of reference. NP RAD (2.88):

$$\mathcal{D}(b, \mu) = \mathcal{D}_{\text{resum}}(b^*(b), \mu) + c_0 b b^*(b), \quad b^*(b) = \frac{b}{\sqrt{1 + \frac{b^2}{B_{\text{NP}}^2}}}. \quad (0.1)$$

NP part of unpolarized TMDPDF:

$$f_{NP}(x, b) = \exp \left(-\frac{\lambda_1 \bar{x} + \lambda_2 x + x \bar{x} \lambda_5}{\sqrt{1 + \lambda_3 x \lambda_4} b^2} b^2 \right). \quad (0.2)$$

NP part of unpolarized TMDFF:

$$D_{NP}(z, b) = \exp \left(-\frac{\eta_1 z + \eta_2 \bar{z}}{\sqrt{1 + \eta_3 (\mathbf{b}/z)^2} z^2} \frac{b^2}{z^2} \right) \left(1 + \eta_4 \frac{b^2}{z^2} \right). \quad (0.3)$$

I. SV19_NNLO_M=0

Fit: DY+SIDIS (457+582=1039 points)

Perturbative order: NNLO

Number of replicas: 300

Constants-file: const-DY+SIDIS_NNP31+DSS_nnlo_m=0

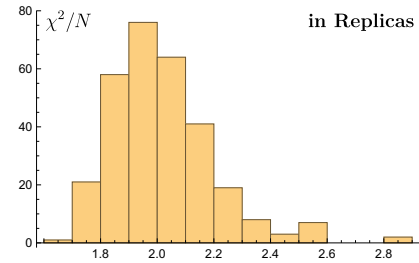
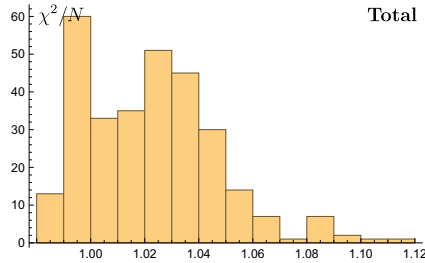
Replica-file: SV19_nnlo_m=0.rep

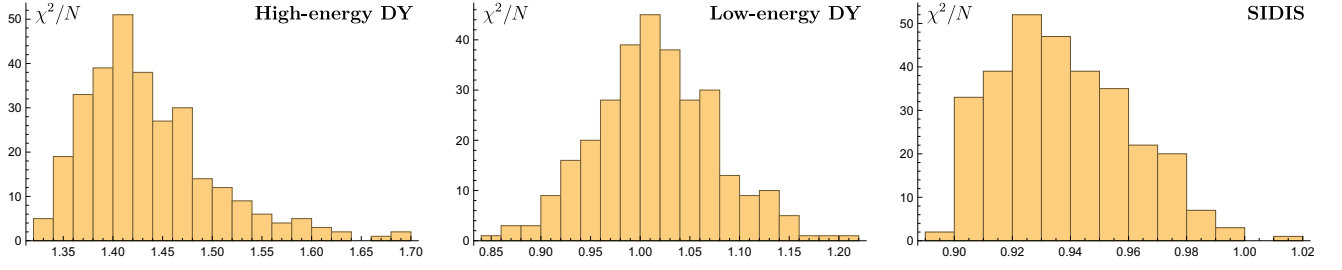
Distinctive feature: Target and production mass corrections in SIDIS kinematics are neglected.

Additional restrictions: Parameter fixed: $B_{NP} = 2\text{GeV}$.

name	N	chiL ² /N	chiD ² /N	chi ² /N	sys.shift%
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CDF1	33	0.538	0.100	0.639	7.095
CDF2	39	1.335	0.001	1.336	1.334
D01	16	0.762	0.005	0.768	-1.287
D02	8	1.437	0.000	1.437	0.000
D02m	3	0.421	0.300	0.721	0.293
A7-00y10	5	1.452	0.002	1.454	-0.036
A7-10y20	5	5.522	0.011	5.533	-0.085
A7-20y24	5	1.367	0.000	1.367	-0.010
A8-00y04	5	2.397	0.099	2.496	2.019
A8-04y08	5	2.586	0.464	3.050	2.018
A8-08y12	5	0.826	0.300	1.126	2.164
A8-12y16	5	1.515	0.268	1.782	2.750
A8-16y20	5	0.765	0.287	1.052	3.456
A8-20y24	5	1.716	0.908	2.624	4.143
A8-46Q66	3	0.243	0.085	0.328	-0.265
A8-116Q150	7	0.750	0.031	0.781	0.278
CMS7	8	1.248	0.000	1.248	0.000
CMS8	8	0.772	0.000	0.772	0.000
LHCb7	8	1.612	0.569	2.181	4.535
LHCb8	7	2.773	1.052	3.825	4.453
LHCb13	9	0.607	0.185	0.792	5.044
PHE200	3	0.284	0.000	0.284	-0.250
E228-200	43	1.034	0.043	1.077	33.958
E228-300	53	1.005	0.025	1.029	28.507
E228-400	76	0.834	0.008	0.842	19.414
E772	35	1.895	0.015	1.910	7.230
E605	53	0.513	0.034	0.547	20.057
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Total	457	1.096	0.079	1.175	

name	N	chiL ² /N	chiD ² /N	chi ² /N	sys.shift%
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hermes.p.vmsub.zxpt.pi+	24	2.371	0.237	2.607	1.983
hermes.p.vmsub.zxpt.pi-	24	1.277	0.044	1.321	0.853
hermes.d.vmsub.zxpt.pi+	24	0.680	0.023	0.703	0.683
hermes.d.vmsub.zxpt.pi-	24	0.880	0.029	0.909	0.772
hermes.p.vmsub.zxpt.k+	24	0.630	0.000	0.630	-0.039
hermes.p.vmsub.zxpt.k-	24	0.627	0.000	0.627	0.061
hermes.d.vmsub.zxpt.k+	24	0.474	0.000	0.474	0.038
hermes.d.vmsub.zxpt.k-	24	1.214	0.001	1.215	0.159
compass.d.h+	195	0.686	0.005	0.691	1.148
compass.d.h-	195	0.817	0.064	0.881	-4.102
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Total	582	0.840	0.037	0.877	





Parameter vectors:

$$\text{Mean} = \{2., 0.0399, 0.186, 7.64, 492., 2.23, -2.49, 0., 0., 0.187, 0.476, 0.500, 0.428\} \quad (1.1)$$

$$\text{std} = \{0., 0.0036, 0.0088, 0.52, 70., 0.087, 0.74, 0., 0., 0.016, 0.015, 0.032, 0.027\} \quad (1.2)$$

Distribution of parameters over replicas

