

TMDs

This page summarises the literature on TMDs and the models that were explored so far.

Code: <https://github.com/uva-spin/TMDs>

Running TMD-ANN Fits on Rivanna

Software:

1. NNPDF:
<https://docs.nnpdf.science/get-started/index.html>
<https://nnpdf.mi.infn.it/for-users/polarized-pdf-sets/>
2. PARTONS:
<https://partons.cea.fr/partons/doc/html/index.html>

Lectures:

- 1) Barone - Cabeo lecture notes: https://www.fe.infn.it/cabeo_school/2010/cabeo_school_2010.pdf
- 2) Bacchetta - Trento lecture notes: https://www2.pv.infn.it/~bacchetta/teaching/Bacchetta_Trento2012.pdf
- 3) Jaffe - Erice lecture notes: <https://arxiv.org/pdf/hep-ph/9602236.pdf>
- 4) Mulders - GGI lecture notes: <http://www.nat.vu.nl/~mulders/tmdreview-vs3.pdf>
- 5) Andrea Singori (HUGS 2021 lectures):
https://indico.jlab.org/event/446/contributions/8419/attachments/7024/9719/HUGS2021_TMDs_lecture_1.pdf
https://indico.jlab.org/event/446/contributions/8420/attachments/7025/9720/HUGS2021_TMDs_lecture_2.pdf
https://indico.jlab.org/event/446/contributions/8429/attachments/7049/9721/HUGS2021_TMDs_lecture_3.pdf
https://indico.jlab.org/event/446/contributions/8430/attachments/7050/9723/HUGS2021_TMDs_lecture_4.pdf
- 6) <https://www.youtube.com/watch?v=d7mtgGnRiNc>

Twist:

- 1) SPIN, TWIST AND HADRON STRUCTURE IN DEEP INELASTIC PROCESSES <https://arxiv.org/abs/hep-ph/9602236v1>

Other Introductory:

- 1) Introduction to QCD <https://arxiv.org/abs/1207.2389>

Introductory/detailed type references:

- 1) TMD Handbook (2023): <https://arxiv.org/abs/2304.03302>
- 2) HUGS references (summary): <https://www.jlab.org/education/hugs/references>
- 3) EPJ-A topical issue: The 3D structure of the nucleon https://link.springer.com/journal/10050/topicalCollection/AC_628286e999d9a60c9a780398df15f93d
- 4) Diehl: Introduction to GPDs and TMDs <https://inspirehep.net/literature/1408303>
- 5) Bacchetta et al.: Single spin asymmetries: the Trento conventions <https://inspirehep.net/literature/660999>
- 6) Collins: Light cone variables, rapidity and all that <https://inspirehep.net/literature/443368>
- 7) Fragmentation Functions: <https://arxiv.org/pdf/1607.02521.pdf>
- 8) Metz-Vossen: Parton fragmentation functions <https://inspirehep.net/literature/1475000>
- 9) Scimemi: A short review on recent developments in TMD factorization and implementation <https://inspirehep.net/literature/1716549>
- 10) COMPASS: (Boer-Mulders): https://www.compass.cern.ch/compass/publications/theses/2019_dpl_rudnicki.pdf
- 11) FNAL E866/NuSea: D-Y in p+d, 2006: <https://inspirehep.net/literature/725479>
- 12) FNAL E866/NuSea: D-Y in p+p, 2008: <https://inspirehep.net/literature/803693>
- 13) Sivers and Boer-Mulders observables from lattice QCD : <https://arxiv.org/abs/1111.4249>

B1-Structure function

1. <https://slideplayer.com/slide/15720788/>
2. <https://journals.aps.org/prd/abstract/10.1103/PhysRevD.95.074036>
3. <https://inspirehep.net/literature/684394> (first measurement HERMES)

Boer-Mulders references:

- 1) <https://arxiv.org/abs/2004.02117> : New study of the Boer-Mulders function: Implications for the quark and hadron transverse momenta (2020)
- 2) <https://arxiv.org/abs/0803.1692> : Extracting Boer-Mulders functions from Deuteron Drell-Yan processes (2008)
- 3) <https://arxiv.org/abs/2111.02766>: pion-proton Drell-Yan process at COMPASS
- 4) <https://arxiv.org/abs/0912.2031>: Updating Boer-Mulders functions from unpolarized pd and pp Drell-Yan data (2009)
- 5) <https://link.springer.com/article/10.1007/s11467-015-0525-6> : Spin physics through unpolarized processes (2016)

lambda, mu, nu related

- 1) <https://arxiv.org/pdf/1907.11356.pdf>
- 2) <https://arxiv.org/pdf/2207.10714.pdf>
- 3) <https://arxiv.org/pdf/0708.0578.pdf>
- 4) <https://arxiv.org/pdf/hep-ph/0604177.pdf>
- 5) <https://arxiv.org/pdf/0809.2262.pdf>

J/Psi TSSA Papers

- 1) <https://arxiv.org/abs/1607.00275>
- 2) <https://arxiv.org/abs/1703.01991>
- 3) <https://arxiv.org/abs/1110.4268>
- 4) <https://arxiv.org/abs/2007.03353>
- 5) https://link.springer.com/chapter/10.1007%2F978-981-15-6292-1_47
- 6) <https://arxiv.org/pdf/1501.04915.pdf>

Experimental Overviews:

- 1) Dudek et al.: Physics opportunities with the 12 GeV upgrade at Jefferson Lab <https://inspirehep.net/literature/1125972>
- 2) Accardi et al.: Electron Ion Collider: The next QCD Frontier - understanding the glue that binds us all <https://inspirehep.net/literature/1206324>

Models

1. Light-front quark model
 - <https://arxiv.org/abs/0806.2298>
 - <https://arxiv.org/abs/0903.1271>
 - <https://doi.org/10.1103/PhysRevD.79.054008>
 - <https://arxiv.org/abs/1104.4564>
 - <https://arxiv.org/abs/1407.1655>
2. Spectator model
 - <https://arxiv.org/abs/hep-ph/9704335>
 - <https://arxiv.org/abs/hep-ph/0209085>
 - <https://arxiv.org/abs/hep-ph/0310319>
 - <https://arxiv.org/abs/0708.0324>
 - <https://arxiv.org/abs/0807.0323>
 - <https://inspirehep.net/files/2dc0be6b78d490f716d88a17aa689ff3>
 - <https://arxiv.org/abs/hep-ph/0611158>
3. Bag models
 - <https://arxiv.org/abs/0805.3355>
 - <https://arxiv.org/abs/1001.5467>
4. Chiral quark soliton model
 - <https://arxiv.org/abs/1102.4704>
 - <https://arxiv.org/abs/0903.1886>
 - <https://arxiv.org/abs/1309.2990>
5. Covariant parton model
 - <https://arxiv.org/abs/0903.3490>
 - <https://arxiv.org/abs/1012.5296>
6. Scalar diquark model
 - <https://arxiv.org/abs/hep-ph/0201296>
7. Quark-target model
 - <https://arxiv.org/abs/hep-ph/0703176>
 - <https://arxiv.org/abs/hep-ph/0107073>
 - <https://arxiv.org/abs/hep-ph/0601133>
 - <https://arxiv.org/abs/0912.1446>
8. Non-relativistic models

Thesis documents

1. Filippo Delcarro Thesis <https://inspirehep.net/literature/1763931>
2. Andrea Signori Thesis <https://inspirehep.net/literature/1493030>

Presentations & Discussions:

09 Dec 2020 TMDs in di-quark spectator model [TMD_update_Diquark_Spectator_Model_12-09-2020_IsharaFernando.pdf](#)

20 Jan 2021 TMDs in Bag Model [TMD_update_Bag_Model_01-20-2020.pdf](#)