

LEP design report, <http://cdsweb.cern.ch/record/102083>. CERN-LEP-84-01, 1984.

ATLAS Collaboration. The ATLAS experiment at the CERN Large Hadron Collider. *J. Instrum.*, 3:S08003, 2008.

CMS Collaboration. The CMS experiment at the CERN LHC. *J. Instrum.*, 3:S08004, 2008.

LHCb Collaboration. The LHCb detector at the LHC. *J. Instrum.*, 3:S08005, 2008.

ALICE Collaboration. The ALICE experiment at the CERN LHC. *J. Instrum.*, 3:S08002, 2008.

TOTEM Collaboration. The TOTEM experiment at the CERN Large Hadron Collider. *J. Instrum.*, 3:S08007, 2008.

LHCf Collaboration. The LHCf detector at the CERN Large Hadron Collider. *J. Instrum.*, 3:S08006, 2008. <https://doi.org/10.1088/1748-0221/3/08/S08006>

MoEDAL Collaboration. The physics programme of the MoEDAL experiment at the LHC. *Int. J. Mod. Phys. A*, 29:1430050, 2014. <http://home.web.cern.ch>.
<http://www.fnal.gov/pub/tevatron/tevatron-accelerator.html>.

A. Macpherson. Introduction and review of the year. LHC Beam Operation Workshop, Evian, December 2012.

R. Alemany-Fernandez et al. Operation and configuration of the LHC in Run 1. CERN-ACC-NOTE-2013-0041, 2013.

CMS Collaboration. CMS physics TDR: Volume I (PTDR1), detector performance and software. CERN-LHCC-2006-001, 2006.

CMS Collaboration. ECAL detector performance plots. CMS-DP-2013-007, 2013.

CMS Collaboration. Energy calibration and resolution of the CMS electromagnetic calorimeter in pp collisions at $\sqrt{s} = 7$ TeV. *J. Instrum.*, 8:P09009, 2013. <https://doi.org/10.1088/1748-0221/8/09/P09009>

G. Baiatian et al. Performance of the TOTEM detectors at the LHC. *Eur. Phys. J. C*, 53:139, 2008.

E. Kuznetsova. Performance and calibration of CASTOR calorimeter at CMS. *Phys. Procedia.*, 37:356, 2012. <https://doi.org/10.1016/j.phpro.2012.02.386>

TOTEM Collaboration. Performance of the TOTEM detectors at the LHC. *Int. J. Mod. Phys. A*, 28:1330046, 2013.

E. Castro et al. The CMS Beam Conditions and Radiation Monitoring System. *Phys. Procedia.*, 37:2097, 2012. <https://doi.org/10.1016/j.phpro.2012.05.330>

G. Aguillion et al. Thin scintillating tiles with high light yield for the OPAL endcaps. *Nucl. Instrum. Meth. A*, 417:266, 1998.

CMS Collaboration. The CMS trigger system. *J. Instrum.*, 12:P01020, 2017. <https://www.scientificlinux.org/>.

S. Agostinelli et al. GEANT4 - a simulation toolkit. *Nucl. Instrum. Meth. A*, 506:250, 2003.

- J. Allison et al. GEANT4 developments and applications. IEEE Transactions on Nuclear Science, 53:278, 2006.
- M. Dobbs, J.B. Hansen. The HEPMC C++ Monte Carlo event record for high energy physics. Comput. Phys. Commun., 134:41, 2001. [https://doi.org/10.1016/S0010-4655\(00\)00189-2](https://doi.org/10.1016/S0010-4655(00)00189-2)
- T. Sjöstrand, S. Mrenna, P. Skands. PYTHIA 6.4 physics and manual. J. High Energy Phys., 05:026, 2006. <https://doi.org/10.1088/1126-6708/2006/05/026>
- R. Field. Min-bias and the underlying event at the LHC. Acta Phys.Polon. B, 42:2631, 2011. <https://doi.org/10.5506/APhysPolB.42.2631>
- T. Sjöstrand. An introduction to PYTHIA 8.2. Comput. Phys. Commun., 191:159, 2015. <https://doi.org/10.1016/j.cpc.2015.01.024>
- R. Corke, T. Sjöstrand. Interleaved parton showers and tuning prospects. J. High Energy Phys., 1103:032, 2011. [https://doi.org/10.1007/JHEP03\(2011\)032](https://doi.org/10.1007/JHEP03(2011)032)
- X. Rouby, J. de Favereau, K. Piotrkowski. HECTOR, a fast simulator for the transport of particles in beamlines. J. Instrum., 2:P09005, 2007. <https://doi.org/10.1088/1748-0221/2/09/P09005>
- N.V. Mokhov, S.I. Striganov. MARS15 overview. Hadronic Shower Simulation Workshop AIP Proceedings 896, Fermilab-Conf-07-008-AD, 2007. <https://doi.org/10.1063/1.2720456>
<https://twiki.cern.ch/twiki/bin/view/cmsspublic/workbookcmsswframework>.
<https://root.cern.ch/>.
- T. Sjöstrand. Monte Carlo generators for the LHC. Academic Training Lecture, 4 Apr 2005, CERN, 2005.
- B.L. Combridge, J. Kripfganz, J. Ranft. Hadron production at large transverse momentum and QCD. Phys. Lett. B, 70:234, 1977. [https://doi.org/10.1016/0370-2693\(77\)90528-7](https://doi.org/10.1016/0370-2693(77)90528-7)
- M. Mangano. Introduction to QCD in hadronic collisions. 3rd CERN - CLAF School of High-Energy Physics, Malargüe, Argentina, CERN-2006-015.81, page 88, 2005.
- A. Donnachie, P.V. Landshoff. Total cross sections. Phys. Lett. B, 296:227, 1992. [https://doi.org/10.1016/0370-2693\(92\)90832-O](https://doi.org/10.1016/0370-2693(92)90832-O)
- T. Sjöstrand, P.Z. Skands. Multiple interactions and the structure of beam remnants. J. High Energy Phys., 03: 053, 2004. <https://doi.org/10.1088/1126-6708/2004/03/053>
- G. Corcella et al. HERWIG 6.5 release note. arXiv:hep-ph/0210213.
- M. Bahr et al. Herwig++ physics and manual. Eur. Phys. J. C, 58:639, 2008. <https://doi.org/10.1140/epjc/s10052-008-0798-9>
- R. Corke. Multiple interactions in PYTHIA 8. arXiv:0901.2852.
- N. Paver, D. Treleani. Multiple interactions in PYTHIA 8. Phys. Lett. B, 146:252, 1984. [https://doi.org/10.1016/0370-2693\(84\)91029-3](https://doi.org/10.1016/0370-2693(84)91029-3)
- CMS Collaboration. Strange particle production in pp collisions at $\sqrt{s}=0.9, 2.36$ and 7 TeV. J. High Energy Phys., 1105:064, 2011.

ALICE Collaboration. Strange particle production in proton–proton collisions at $\sqrt{s} = 0.9$ TeV with ALICE at the LHC. *Eur. Phys. J. C*, 71:1594, 2011.

B. Andersson et al. Parton fragmentation and string dynamics. *Phys. Rep.*, 97:31, 1983.
[https://doi.org/10.1016/0370-1573\(83\)90080-7](https://doi.org/10.1016/0370-1573(83)90080-7)

M. Bähr, S. Gieseke, M.H. Seymour. Simulation of multiple partonic interactions in Herwig++. *J. High Energy Phys.*, 0807:076, 2008. <https://doi.org/10.1088/1126-6708/2008/07/076>

M. Bähr, J.M. Butterworth, M.H. Seymour. The underlying event and the total cross section from Tevatron to the LHC. *J. High Energy Phys.*, 0901:065, 2009. <https://doi.org/10.1088/1126-6708/2009/01/065>

R. Pohl et al. The size of the proton. *Nature*, 466:213, 2010.

G. Marchesini, B.R. Webber. Monte Carlo simulation of general hard processes with coherent QCD radiation. *Nucl. Phys. B*, 310:461, 1988. [https://doi.org/10.1016/0550-3213\(88\)90089-2](https://doi.org/10.1016/0550-3213(88)90089-2)

B.R. Webber. A QCD model for jet fragmentation including soft gluon interference. *Nucl. Phys. B*, 238:492, 1984. [https://doi.org/10.1016/0550-3213\(84\)90333-X](https://doi.org/10.1016/0550-3213(84)90333-X)

S. Gieseke, C. Röhr, A. Siódmok. Colour reconnections in HERWIG++. *Eur. Phys. J. C*, 72:2226, 2012.
<https://doi.org/10.1140/epjc/s10052-012-2225-5>

CMS Collaboration. Measurement of energy flow at large pseudorapidities in pp collisions at $\sqrt{s} = 0.9$ and 7 TeV. *J. High Energy Phys.*, 1111:148, 2011.

CMS Collaboration. Measurement of the energy flow at large pseudorapidity at the LHC at $\sqrt{s} = 900$, 2360 and 7000 GeV. CMS PAS FWD-10-002, 2010.

P.Z. Skands. The Perugia tunes. arXiv:0905.3418.

R. Field. Studying the underlying event at CDF and the LHC. Proceedings, 1st MPI Workshop, Perugia, Italy, October 27-31, 2008.

CMS Collaboration. CMS tracking performance results from early LHC operation. *Eur. Phys. J. C*, 70:1165, 2010.

CMS Collaboration. Jets in 0.9 and 2.36 TeV pp collisions. CMS PAS JME-10-001, 2010.

CMS Collaboration. Jets performance in 7 TeV pp collisions. CMS PAS JME-10-003, 2010.

Buckley et al. Systematic event generator tuning for the LHC. *Eur. Phys. J. C*, 65:331, 2010.
<https://doi.org/10.1140/epjc/s10052-009-1196-7>

ATLAS Collaboration. Charged-particle multiplicities in pp interactions measured with the ATLAS detector at the LHC. *New J. Phys.*, 13:053033, 2011.

P.Z. Skands. Tuning Monte Carlo generators: The Perugia tunes. *Phys. Rev. D*, 82:074018, 2010.
<https://doi.org/10.1103/PhysRevD.82.074018>

H. Jung, G.P. Salam. Hadronic final state predictions from CCFM: the hadron-level Monte Carlo generator CASCADE. *Eur. Phys. J. C*, 19:351, 2001. <https://doi.org/10.1007/s100520100604>

H. Jung et al. The ccfm monte carlo generator cascade 2.2.0. *Eur. Phys. J. C*, 79:1237, 2010.
<https://doi.org/10.1140/epjc/s10052-010-1507-z>

C. Flensburg, G. Gustafson, and L. Lönnblad. Inclusive and exclusive observables from dipoles in high Energy collisions. arXiv:1103.4321v1.

H1 Collaboration. Measurements of transverse energy flow in deep-inelastic scattering at HERA. Eur. Phys. J. C, 12:595, 2000. <https://doi.org/10.1007/s100520000287>

CMS Collaboration. Study of the underlying event at forward rapidity in pp collisions at \sqrt{s} = 0.9, 2.76, and 7 TeV. J. High Energy Phys., 072:1304, 2013.

CMS Collaboration. Design and test beam studies for the CASTOR calorimeter of the CMS experiment. Nucl. Instrum. Meth. A, 623:225, 2010. <https://doi.org/10.1016/j.nima.2010.02.203>

S. Gieseke et al. Herwig++ 2.5 release note. arXiv:1102.1672.

K. Werner, F. Liu, T. Pierog. Parton ladder splitting and the rapidity dependence of transverse momentum spectra in deuteron-gold collisions at RHIC. Phys. Rev. C, 74:44902, 2006. <https://doi.org/10.1103/PhysRevC.74.044902>

S. Ostapchenko. Monte Carlo treatment of hadronic interactions in enhanced Pomeron scheme: I.QGSJET-II model. Phys. Rev. D, 83:014018, 2011. <https://doi.org/10.1103/PhysRevD.83.014018>

E.-J. Ahn et al. Cosmic ray event generator SIBYLL 2.1. Phys. Rev. D, 80:094003, 2009. <https://doi.org/10.1103/PhysRevD.80.094003>

CMS Collaboration. Measurement of the UE activity using leading tracks in p-p at 7 TeV. CMS PAS FSQ-12-020, 2016.

CMS Collaboration. First measurement of the underlying event activity at the LHC with \sqrt{s} = 0.9 TeV. Eur. Phys. J. C, 70:555, 2010.

CMS Collaboration. Measurement of the underlying event activity at the LHC with \sqrt{s} = 7 TeV and comparison with \sqrt{s} = 0.9 TeV. J. High Energy Phys., 09:109, 2011.

CMS Collaboration. Measurement of the underlying event activity using charged-particle jets in proton-proton collisions at \sqrt{s} = 2.76 TeV. J. High Energy Phys., 09:137, 2015.

CMS Collaboration. Measurement of tracking efficiency. CMS PAS TRK-10-002, 2010.

G. D'Agostini. Improved iterative Bayesian unfolding. arXiv:1010.0632.

CMS Collaboration. Underlying event tunes and double parton scattering. CMS PAS GEN-14-001, 2014. <http://home.thep.lu.se/torbjorn/pythia81html/tunes.html>.

F. Close. The quark parton model. Rept. Prog. Phys., 42:1285, 1979. <https://doi.org/10.1088/0034-4885/42/8/001>

V.N. Gribov, L.N. Lipatov. Deep inelastic ep scattering in perturbation theory. Sov. J. Nucl. Phys., 15:438, 1972.

G. Altarelli, G. Parisi. Asymptotic freedom in parton language. Nucl. Phys. B, 126:298, 1977. [https://doi.org/10.1016/0550-3213\(77\)90384-4](https://doi.org/10.1016/0550-3213(77)90384-4)

Y.L. Dokshitzer. Calculation of the structure functions for deep inelastic scattering and e^+e^- annihilation by perturbation theory in quantum chromodynamics. Sov. Phys. JETP, 46:641, 1977.

S. Moch, J.A.M. Vermaseren, A. Vogt. The three-loop splitting functions in QCD: The non-singlet case. Nucl. Phys. B, 688:101, 2004. <https://doi.org/10.1016/j.nuclphysb.2004.03.030>

A. Vogt, S. Moch, J.A.M. Vermaseren. The three-loop splitting functions in QCD: The singlet case. Nucl. Phys. B, 691:129, 2004. <https://doi.org/10.1016/j.nuclphysb.2004.04.024>

E.A. Kuraev, L.N. Lipatov, V.S. Fadin. Multi-Reggeon processes in the Yang–Mills theory. Sov. Phys. JETP, 44:443, 1976.

E.A. Kuraev, L.N. Lipatov, V.S. Fadin. The Pomernanchuk singularity in nonabelian gauge theories. Sov. Phys. JETP, 45:199, 1997.

Ya.Ya. Balitski, L.N. Lipatov. The Pomernanchuk singularity in quantum chromodynamics. Sov. J. Nucl. Phys., 28:822, 1978.

G.P. Salam. An introduction to leading and next-to-leading bfl. Acta Phys. Polon. B, 30:3679, 1999.

K. Kutak, P. Surówka. Non-linear evolution of unintegrated gluon density at large values of coupling constant. Phys. Rev. D, 89:026007, 2014. <https://doi.org/10.1103/PhysRevD.89.026007>

I. Balitsky. Operator expansion for high-energy scattering. Nucl. Phys. B, 463:99, 1996. [https://doi.org/10.1016/0550-3213\(95\)00638-9](https://doi.org/10.1016/0550-3213(95)00638-9)

Y.V. Kovchegov. Small-x F2 structure function of a nucleus including multiple pomeron exchanges. Phys. Rev. D, 60:034008, 1999. <https://doi.org/10.1103/PhysRevD.60.034008>

A. Prokudin. QCD evolution workshop: Introduction. Int. J. Mod. Phys. Conf. Ser., 20:1, 2012. <https://doi.org/10.1142/S2010194512009038>

S. Catani et al. QCD coherence in initial state radiation. Phys. Lett. B, 234:339, 1990. [https://doi.org/10.1016/0370-2693\(90\)91938-8](https://doi.org/10.1016/0370-2693(90)91938-8)

M. Ciafaloni. Coherence effects in initial jets at small q^2/s . Nucl. Phys. B, 296:49, 1988. [https://doi.org/10.1016/0550-3213\(88\)90380-X](https://doi.org/10.1016/0550-3213(88)90380-X)

P. Skands. Introduction to QCD. arXiv:1207.2389.

M. Deak, F. Hautmann, H. Jung, K. Kutak. Forward jet production at the Large Hadron Collider. arXiv: 0908.0538.

A. van Hameren, P. Kotko, K. Kutak, S. Sapeta. Small-x dynamics in forward-central dijet decorrelations at the LHC. arXiv:1404.6204.

M. Bury, M. Deak, K. Kutak, S. Sapeta. Single and double inclusive forward jet production at the LHC at $\sqrt{s} = 7$ and 13 TeV. Phys. Lett. B, 760:594, 2016. <https://doi.org/10.1016/j.physletb.2016.07.041>

G.P. Salam, G. Soyez. A practical seedless infrared-safe cone jet algorithm. J. High Energy Phys., 05:086, 2008. <https://doi.org/10.1088/1126-6708/2007/05/086>

M. Cacciari, G.P. Salam, G. Soyez. The anti-kT jet clustering algorithm. J. High Energy Phys., 04:063, 2008. <https://doi.org/10.1088/1126-6708/2008/04/063>

S. Catani, Y.L. Dokshitzer, M.H. Seymour, B.R. Webber. Longitudinally-invariant kT-clustering algorithms for hadron-hadron collisions. Nucl. Phys. B, 406:187, 1993. [https://doi.org/10.1016/0550-3213\(93\)90166-M](https://doi.org/10.1016/0550-3213(93)90166-M)

Y.L. Dokshitzer, G.D. Leder, S. Moretti, B.R. Webber. Better jet clustering algorithms. *J. High Energy Phys.*, 9708:001, 1997. <https://doi.org/10.1088/1126-6708/1997/08/001>

CMS Collaboration. Measurement of the inclusive jet cross section in pp collisions at $\sqrt{s} = 7$ TeV. *Phys. Rev. Lett.*, 107:132001, 2011.

CMS Collaboration. Tracking and vertexing results from first collisions. CMS PAS TRK-10-001, 2010.

J.M. Butterworth, J.R. Forshaw, M.H. Seymour. Multiparton interactions in photoproduction at HERA. *J. Phys., C*, 72:637, 1996. <https://doi.org/10.1007/BF02909195>

CMS Collaboration. Determination of jet energy calibration and transverse momentum resolution in CMS. *J. Instrum.*, 6:P11002, 2011. <https://doi.org/10.1088/1748-0221/6/11/P11002>

CMS Collaboration. Absolute luminosity normalization. DP-2011-002, 6, 2011.

G.D. Lafferty, T.R. Wyatt. Where to stick your data points: The treatment of measurements within wide bins. *Nucl. Instr. Meth. A*, 355:541, 1995. [https://doi.org/10.1016/0168-9002\(94\)01112-5](https://doi.org/10.1016/0168-9002(94)01112-5)

J. Pumplin, D. Stump, J. Huston et al. New generation of parton distributions with uncertainties from global QCD analysis. *J. High Energy Phys.*, 07:012, 2002. <https://doi.org/10.1088/1126-6708/2002/07/012>

CTEQ Collaboration. Global QCD analysis of parton structure of the nucleon: CTEQ5 parton distributions. *Eur. Phys. J. C*, 12:375, 2000. <https://doi.org/10.1007/s100529900196>

A.D. Martin, R.G. Roberts, W.J. Stirling et al. MRST2001: partons and s from precise deep inelastic scattering and Tevatron jet data. *Eur. Phys. J. C*, 23:73, 2002. <https://doi.org/10.1007/s100520100842>

S. Alioli et al. Jet pair production in POWHEG. *J. High Energy Phys.*, 04:081, 2011. [https://doi.org/10.1007/JHEP04\(2011\)081](https://doi.org/10.1007/JHEP04(2011)081)

Z. Nagy. Three-jet cross sections in hadron hadron collisions at next-to-leading order. *Phys. Rev. Lett.*, 88: 122003, 2002. <https://doi.org/10.1103/PhysRevLett.88.122003>

T. Kluge. K. Rabbertz, M. Wobisch. Fast pQCD calculations for PDF fits. in 14th International Workshop on Deep Inelastic Scattering (DIS2006), page 483, 2006. https://doi.org/10.1142/9789812706706_0110

J.R. Andersen, J.M. Smillie. Constructing all-order corrections to multi-jet rates. *J. High Energy Phys.*, 01:039, 2010. [https://doi.org/10.1007/JHEP01\(2010\)039](https://doi.org/10.1007/JHEP01(2010)039)

J.R. Andersen, J.M. Smillie. Multiple jets at the LHC with high energy jets. *J. High Energy Phys.*, 06:010, 2011. [https://doi.org/10.1007/JHEP06\(2011\)010](https://doi.org/10.1007/JHEP06(2011)010)

S. Alekhin et al. The PDF4LHC working group interim report arXiv:1101.0536.

H. Lai et al. New parton distributions for collider physics. *Phys. Rev. D*, 82:074024, 2010. <https://doi.org/10.1103/PhysRevD.82.074024>

R. Ball et al. A first unbiased global NLO determination of parton distributions and their uncertainty. *Nucl. Phys. B*, 82:136, 2010. <https://doi.org/10.1016/j.nuclphysb.2010.05.008>

A. Martin, W. Stirling, R. Thorne et al. Parton distributions for the LHC. *Eur. Phys. J. C*, 63:189, 2009. <https://doi.org/10.1140/epjc/s10052-009-1072-5>

H1 and ZEUS Collaboration. Combined measurement and QCD analysis of the inclusive ep scattering cross sections at HERA. *J. High Energy Phys.*, 01:109, 2010.

S. Alekhin, J. Blumlein, S. Klein, and S. Moch. The 3-, 4-, and 5-flavor NNLO parton from deep-inelastic scattering data and at hadron colliders. *Phys. Rev. D*, 81:014032, 2010.

<https://doi.org/10.1103/PhysRevD.81.014032>

CMS Collaboration. Ratios of dijet production cross sections as a function of the absolute difference in rapidity between jets in proton–proton collisions at $\sqrt{s} = 7$ TeV. *Eur. Phys. J. C*, 72:2216, 2012.

L. Lönnblad. Ariadne version 4: a program for simulation of QCD cascades implementing the colour dipole model. *Comput. Phys. Commun.*, 71:15, 1992. [https://doi.org/10.1016/0010-4655\(92\)90068-A](https://doi.org/10.1016/0010-4655(92)90068-A)

A.H. Mueller, H. Navelet. An inclusive minijet cross section and the bare pomeron in QCD. *Nucl. Phys. B*, 282: 727, 1987. [https://doi.org/10.1016/0550-3213\(87\)90705-X](https://doi.org/10.1016/0550-3213(87)90705-X)

D0 Collaboration. Probing BFKL dynamics in the dijet cross section at large rapidity intervals in $p\bar{p}$ collisions at $\sqrt{s} = 1800$ GeV and 630 GeV. *Phys. Rev. Lett.*, 84:5722, 2000.

D0 Collaboration. The azimuthal decorrelation of jets widely separated in rapidity. *Phys. Rev. Lett.*, 77:595, 1996.

J.R. Anderson, V. Del Luca, S. Frixione, C.R. Schmidt, W.J. Stirling. Mueller-Navelet jets at hadron colliders. *J. High Energy Phys.*, 0102:007, 2001. <https://doi.org/10.1088/1126-6708/2001/02/007>

V. Del Duca, C.R. Schmidt. Dijet production at large rapidity intervals. *Phys. Rev. D*, 49:4510, 1994. <https://doi.org/10.1103/PhysRevD.49.4510>

W.T. Giele, E.W.N. Glover, D.A. Kosower. Two-jet differential cross section at $\mathcal{O}(\alpha_s^3)$ in hadron collisions. *Phys. Rev. Lett.*, 73:2019, 1994. <https://doi.org/10.1103/PhysRevLett.73.2019>

W.T. Giele, E.W.N. Glover, D.A. Kosower. Higher order corrections to jet cross sections in hadron colliders. *Nucl. Phys. B*, 403:633, 1993. [https://doi.org/10.1016/0550-3213\(93\)90365-V](https://doi.org/10.1016/0550-3213(93)90365-V)

A. Sabio Vera. The effect of NLO conformal spins in azimuthal angle decorrelation of jet pairs. *Nucl. Phys. B*, 746:1, 2006. <https://doi.org/10.1016/j.nuclphysb.2006.04.004>

W.J. Stirling. Production of jet pairs at large relative rapidity in hadron hadron collisions as a probe of the perturbative pomeron. *Nucl. Phys. B*, 423:56, 1996. [https://doi.org/10.1016/0550-3213\(94\)90565-7](https://doi.org/10.1016/0550-3213(94)90565-7)

M. Angioni et al. Dijet production at large rapidity separation in $N=4$ SYM. *Phys. Rev. Lett.*, 107:191601, 2011. <https://doi.org/10.1103/PhysRevLett.107.191601>

A. Sabio Vera, F. Schwennsen. The azimuthal decorrelation of jets widely separated in rapidity as a test of the BFKL kernel. *Nucl. Phys. B*, 776:170, 2007. <https://doi.org/10.1016/j.nuclphysb.2007.03.050>

V.T. Kim, G.B. Pivovarov. BFKL QCD pomeron in high-energy hadron collisions: inclusive dijet production. *Phys. Rev. D*, 53:6, 1996. <https://doi.org/10.1103/PhysRevD.53.R6>

CMS Collaboration. Azimuthal decorrelation of jets widely separated in rapidity in pp collisions at $\sqrt{s} = 7$ TeV. *J. High Energy Phys.*, 08:139, 2016.

CMS Collaboration. Calorimeter jet quality criteria for the first CMS collision data. CMS-PAS-JME-09-008, 2010.

T. Gleisberg et al. Event generation with SHERPA 1.1. J. High Energy Phys., 02:007, 2009.
<https://doi.org/10.1088/1126-6708/2009/02/007>

B. Ducloue, L. Szymanowski, S. Wallon. Evidence for high-energy resummation effects in Mueller-Navelet jets at the LHC. Phys. Rev. Lett., 112:082003, 2013.
<https://doi.org/10.1103/PhysRevLett.112.082003>

A.C. Irving, R.P. Worden. Regge phenomenology. Phys. Rep., 34 (3):117, 1977.
[https://doi.org/10.1016/0370-1573\(77\)90010-2](https://doi.org/10.1016/0370-1573(77)90010-2)

P. Desgrolard, M. Giffon, E. Martynov, E. Predazzi. Exchange-degenerate Regge trajectories: a fresh look from resonance and forward scattering regions. Eur. Phys. J. C, 18:555, 2001.
<https://doi.org/10.1007/s100520100548>

H. Kottler. The Pomeranchuk theorem and the Pomeranchuk-Okun rule. Nuovo Cim. A, 67:88, 1970.
<https://doi.org/10.1007/BF02728415>

R.G. Newton. Optical theorem and beyond. Am. J. Phys., 44 (7):639, 1976.
<https://doi.org/10.1119/1.10324>

G.A. Jaroszkiewicz, P.V. Landshoff. Model for diffraction excitation. Phys. Rev. D, 10:170, 1974.
<https://doi.org/10.1103/PhysRevD.10.170>

TOTEM Collaboration. Measurement of proton–proton elastic scattering and total cross-section at $\sqrt{s} = 7$ TeV. Europhys. Lett., 101:21003, 2013.

H1 Collaboration. Measurement and QCD analysis of the diffractive deep-inelastic scattering cross-section at HERA. Eur. Phys. J. C, 48:715, 2006.

H1 Collaboration. Dijet cross sections and parton densities in diffractive DIS at HERA. J. High Energy Phys., 0710:042, 2007. <https://doi.org/10.1088/1126-6708/2007/10/042>

ZEUS Collaboration. Dissociation of virtual photons in events with a leading proton at HERA. Eur. Phys. J. C, 38:43, 2004. <https://doi.org/10.1140/epjc/s2004-02047-4>

CDF Collaboration. Diffractive dijets with a leading antiproton in $\bar{p}p$ collisions at $\sqrt{s} = 1800$ GeV. Phys. Rev. Lett., 84:5043, 2000.

ZEUS Collaboration. Deep inelastic inclusive and diffractive scattering at Q^2 values from 25 to 320 GeV^2 with the ZEUS forward plug calorimeter. Nucl. Phys. B., 800:1, 2008.

CMS Collaboration. Measurement of diffraction dissociation cross sections in pp collisions at $\sqrt{s} = 7$ TeV. Phys. Rev. D, 92:012003, 2015.

G.A. Schuler and T. Sjöstrand. Hadronic diffractive cross sections and the rise of the total cross section. Phys. Rev. D, 49:2257, 1994. <https://doi.org/10.1103/PhysRevD.49.2257>

K. Goulianos. Diffraction in QCD. arXiv:hep-ph/020314.

R. Ciesielski, K. Goulianos. MBR Monte Carlo simulation in PYTHIA8. arXiv:1205.1446.

F.W. Bopp, R. Engel, and J. Ranft. Rapidity gaps and the PHOJET Monte Carlo. arXiv:hep-ph/9803437.

R. Engel. Photoproduction within the two-component Dual Parton Model: amplitudes and cross-sections. *J. Phys. C*, 66:203, 1995. <https://doi.org/10.1007/BF01496594>

T. Auye. Unfolding algorithms and tests using RooUnfold. *PHYSTAT 2011 Workshop on Statistical Issues Related to Discovery Claims in Search Experiments and Unfolding*, H. Prosper and L. Lyons, eds., p. 313. Geneva, Switzerland, 2011.

ALICE Collaboration. Measurement of inelastic, single- and double-diffraction cross sections in proton–proton collisions at the LHC with ALICE. *Eur. Phys. J. C*, 73:2456, 2013.

CDF Collaboration. Measurement of $p\bar{p}$ single diffraction dissociation at $\sqrt{s} = 546$ GeV and 1800 GeV. *Phys. Rev. D*, 50:5535, 1994.

CDF Collaboration. Double diffraction dissociation at the Fermilab Tevatron collider. *Phys. Rev. Lett.*, 87: 141802, 2001.

E710 Collaboration. Diffraction dissociation in $p\bar{p}$ collisions at $\sqrt{s} = 1.8$ TeV. *Phys. Lett. B*, 301:313, 1993.

UA4 Collaboration. The cross section of diffraction dissociation at the CERN SPS collider. *Phys. Lett. B*, 186: 227, 1987. [https://doi.org/10.1016/0370-2693\(87\)90285-1](https://doi.org/10.1016/0370-2693(87)90285-1)

CHLM Collaboration. Inelastic diffractive scattering at the CERN ISR. *Nucl. Phys. B*, 108:1, 1976.

J. C. M. Armitage et al. Diffraction dissociation in proton–proton collisions at ISR energies. *Nucl. Phys. B*, 194:365, 1982. [https://doi.org/10.1016/0550-3213\(82\)90014-1](https://doi.org/10.1016/0550-3213(82)90014-1)

E. Gotsman, E. Levin, U. Maor. Description of LHC data in a soft interaction model. *Phys. Lett. B*, 716:425, 2012. <https://doi.org/10.1016/j.physletb.2012.08.042>

A.B. Kadalov, M.G. Poghosyan. Predictions of the quark-gluon string model for pp at LHC. *Eur. Phys. J. C*, 67:397, 2010. <https://doi.org/10.1140/epjc/s10052-010-1301-y>

A.B. Kadalov, M.G. Poghosyan. Predictions for proton–proton interaction cross-sections at LHC. arXiv: 1109.3697.

UA8 Collaboration. Evidence for a superhard pomeron structure. *Phys. Lett. B*, 297:417, 1992. [https://doi.org/10.1016/0370-2693\(92\)91281-D](https://doi.org/10.1016/0370-2693(92)91281-D)

CDF Collaboration. Measurement of diffractive dijet production at the Fermilab Tevatron. *Phys. Rev. Lett.*, 79:2636, 1997.

D0 Collaboration. Hard single diffraction in $p\bar{p}$ collisions at $\sqrt{s}=630$ and 1800 GeV. *Phys. Lett. B*, 531:52, 2002.

ZEUS Collaboration. Deep inelastic scattering with leading protons or large rapidity gaps at HERA. *Nucl. Phys. B*, 816:1, 2009. <https://doi.org/10.1088/1126-6708/2009/06/074>

ZEUS Collaboration. The QCD analysis of ZEUS diffractive data. *Nucl. Phys. B*, 831:1, 2010.

CMS Collaboration. Observation of a diffractive contribution to dijet production in proton–proton collisions at $\sqrt{s} = 7$ TeV. *Phys. Rev. D*, 87:012006, 2013.

H1 Collaboration. Measurement and QCD analysis of the diffractive deep-inelastic scattering cross section at HERA. *Eur. Phys. J. C*, 48:715, 2006.

P. Bruni, A. Edin and G. Ingelman. <http://www3.tsl.uu.se/thepp/mc/pompyt/>.

B.E. Cox and J.R. Forshaw. POMWIG: HERWIG for diffractive interactions. Comput. Phys. Commun., 144: 104, 2002. [https://doi.org/10.1016/S0010-4655\(01\)00467-2](https://doi.org/10.1016/S0010-4655(01)00467-2)

CMS Collaboration. Forward energy flow, central charged-particle multiplicities, and pseudorapidity gaps in W and Z boson events from pp collisions at $\sqrt{s}=7$ TeV. Eur. Phys. J. C, 72:1839, 2012.

CDF Collaboration. Observation of diffractive W boson production at the Tevatron. Phys. Rev. Lett., 78:2698, 1997.

D0 Collaboration. Observation of diffractively produced W and Z bosons in $\bar{p}p$ collisions at $\sqrt{s} = 1800$ GeV. Phys. Lett. B, 574:169, 2003.

CDF Collaboration. Diffractive W and Z production at the Fermilab Tevatron. Phys. Rev. D, 82:112004, 2010.

CMS Collaboration. Measurement of the rapidity and transverse momentum distributions of Z bosons in pp collisions at $\sqrt{s}= 7$ TeV. Phys. Rev. D, 85:032002, 2012.

D0 Collaboration. Rapidity gaps between jets in $\bar{p}p$ collisions at $\sqrt{s} = 1.8$ TeV. Phys. Rev. Lett., 72:2332, 1994.

D0 Collaboration. Jet production via strongly-interacting color-singlet exchange in $\bar{p}p$ collisions. Phys. Rev. Lett., 76:734, 1996.

D0 Collaboration. Probing hard color-singlet exchange in $\bar{p}p$ collisions at $\sqrt{s} = 630$ GeV and 1800 GeV. Phys. Lett. B, 440:189, 1998.

CDF Collaboration. Observation of rapidity gaps in $\bar{p}p$ collisions at 1.8 TeV. Phys. Rev. Lett., 74:855, 1995.

CDF Collaboration. Dijet production by color-singlet exchange at the Fermilab Tevatron. Phys. Rev. Lett., 80: 1156, 1998.

CDF Collaboration. Events with a rapidity gap between jets in $\bar{p}p$ collisions at $\sqrt{s} = 630$ GeV. Phys. Rev. Lett., 81:5278, 1998.

ZEUS Collaboration. Rapidity gaps between jets in photoproduction at HERA. Phys. Lett. B, 369:55, 1996.

H1 Collaboration. Energy flow and rapidity gaps between jets in photoproduction at HERA. Eur. Phys. J. C, 24:517, 2002. <https://doi.org/10.1007/s10052-002-0988-9>

CMS Collaboration. Dijet production with a large rapidity gap between the jets. CMS PAS FSQ-12-001, 2012.

A.H. Mueller and W.-K. Tang. High-energy parton-parton elastic scattering in QCD. Phys. Lett. B, 284:123, 1998. [https://doi.org/10.1016/0370-2693\(92\)91936-4](https://doi.org/10.1016/0370-2693(92)91936-4)

R. Enberg, G. Ingelman, L. Motyka. Hard colour singlet exchange and gaps between jets at the Tevatron. Phys. Lett. B, 524:273, 2002. [https://doi.org/10.1016/S0370-2693\(01\)01379-X](https://doi.org/10.1016/S0370-2693(01)01379-X)

J. R. Cudell, A. Dechambre, O. F. Hernandez, I.P. Ivanov. Central exclusive production of dijets at hadronic colliders. Eur. Phys. J. C, 61:369, 2009.

<https://doi.org/10.1140/epjc/s10052-009-0994-2>

I.P. Ivanov, N.N. Nikolaev. Anatomy of the differential gluon structure function of the proton from the experimental data on F2p. Phys. Rev. D, 65:054004, 2002.

<https://doi.org/10.1103/PhysRevD.65.054004>

J.C. Collins. Sudakov form factors. arXiv:hep-ph/0312336.

L.A. Harland-Lang, V.A. Khoze, M.G. Ryskin, W.J. Stirling. The phenomenology of central exclusive production at hadron colliders. arXiv:1204.4803.

J. de Favereau de Jeneret, V. Lemaitre, Y. Liu et al. High energy photon interactions at the LHC. arXiv:0908.2020.

D. Schildknecht. Vector meson dominance. Acta Phys. Polon. B, 37:595, 2006.

CMS Collaboration. Exclusive photon–photon production of muon pairs in proton–proton collisions at $\sqrt{s} = 7$ TeV. J. High Energy Phys., 1201:052, 2012.

V.A. Khoze, A.D. Martin, R. Orava. Luminosity monitors at the LHC. Eur. Phys. J C, 19:313, 2001.

<https://doi.org/10.1007/s100520100616>

A.G. Shamov, V.I. Telnov. Precision luminosity measurement at LHC using two-photon production of $\mu^+\mu^-$ pairs. Nucl. Instrum Meth. A, 494:51, 2002. [https://doi.org/10.1016/S0168-9002\(02\)01444-4](https://doi.org/10.1016/S0168-9002(02)01444-4)

CMS Collaboration. Performance of muon identification in pp collisions at $\sqrt{s}=7$ TeV. PAS-MUO-10-002, 2010.

J.A.M. Vermaseren. Two photon processes at very high-energies. Nucl. Phys. B, page 347, 1983.

[https://doi.org/10.1016/0550-3213\(83\)90336-X](https://doi.org/10.1016/0550-3213(83)90336-X)

S.P. Baranov, O. Duenger, H. Shooshtariand et al. Proceedings Physics at HERA 3, page 1478, 1991.

L. Motyka, G. Watt. Exclusive photoproduction at the Fermilab Tevatron and CERN LHC within the dipole picture. Phys. Rev. D, 78:014023, 2008. <https://doi.org/10.1103/PhysRevD.78.014023>

A.R. White. The physics of a sextet quark sector. Phys. Rev. D, 72:036007, 2005.

<https://doi.org/10.1103/PhysRevD.72.036007>

C.R. Vane, S. Datz, P.F. Dittner et al. Electron-positron pair production in Coulomb collisions of ultrarelativistic sulfur ions with fixed target. Phys. Rev. Lett., 69, 1992.

<https://doi.org/10.1103/PhysRevLett.69.1911>

C.R. Vane, S. Datz, E.F. Deveney et al. Measurements of positrons from pair production in Coulomb collisions of 33 TeV lead ions with fixed targets. Phys. Rev. A, 56:3682, 1997.

<https://doi.org/10.1103/PhysRevA.56.3682>

PHENIX Collaboration. Photoproduction of J/ψ and of high mass e^+e^- in ultra-peripheral AuAu collisions at $\sqrt{s} = 200$ GeV. Phys. Lett. B, 321:679, 2009.

CDF Collaboration. Observation of exclusive e^+e^- production in hadron–hadron collisions. Phys. Rev. Lett., 98:112001, 2007.

CMS Collaboration. Search for exclusive or semi-exclusive photon pair production and observation of exclusive and semi-exclusive electron pair production in pp collisions at $\sqrt{s} = 7$ tev. J. High Energy Phys., 1211:080, 2012.

V. Khoze, A. Martin, M. Ryskin. Diffractive Higgs production: myths and reality. *Eur. Phys. J. C*, 26:229, 2002. <https://doi.org/10.1140/epjc/s2002-01067-4>

A. De Roeck, V. Khoze, A. Martin, R. Orava, M. Ryskin. Ways to detect a light higgs boson at the LHC. *Eur. Phys. J. C*, 25:391, 2002. <https://doi.org/10.1007/s10052-002-1032-9>

L. Harland-Lang, V. Khoze, M. Ryskin et al. Central exclusive meson pair production in the perturbative regime at hadron colliders. *Eur. Phys. J. C*, 71:1714, 2011. <https://doi.org/10.1140/epjc/s10052-011-1714-2>

A.L. Read. Presentation of search results: the CLS technique. *J. Phys. G*, 28:2693, 2002. <https://doi.org/10.1088/0954-3899/28/10/313>

J. Monk, A. Pilkington. ExHuME 1.3: A Monte Carlo event generator for exclusive diffraction. *Comput. Phys. Commun.*, 175:232, 2006. <https://doi.org/10.1016/j.cpc.2006.04.005>

A.D. Martin, R.G. Roberts, W.J. Stirling, R.S. Thorne. MRST2001: partons and α_s from precise deep inelastic scattering and Tevatron jet data. *Eur. Phys. J. C*, 23:73, 2002. <https://doi.org/10.1007/s100520100842>

E. Chapon, C. Royon, O. Kepka. Anomalous quartic $WW\gamma\gamma$, $ZZ\gamma\gamma$, and trilinear $WW\gamma$ couplings in twophoton processes at high luminosity at the LHC. *Phys. Rev. D*, 81:074003, 2010. <https://doi.org/10.1103/PhysRevD.81.074003>

J. Ellison, J. Wudka. Study of trilinear gauge boson couplings at the Tevatron collider. arXiv:9804322.

D0 Collaboration. Studies of WW and WZ production and limits on anomalous $WW\gamma$ and WWZ couplings. *Phys. Rev. D*, 60:072002, 1999.

D0 Collaboration. Limits on anomalous trilinear gauge couplings from $WW \rightarrow e^+e^-$, $WW \rightarrow e^\pm\mu^\pm$, and $WW \rightarrow \mu^+\mu^-$ events from $\bar{p}p$ collisions at $\sqrt{s} = 1.96$ TeV. *Phys. Rev. D*, 74:057101, 2006.

ALEPH Collaboration. Constraints on anomalous QGC's in e^+e^- interactions from 183 GeV to 209 GeV. *Phys. Lett. B*, 602:31, 2004. [https://doi.org/10.1016/S0370-2693\(04\)01365-6](https://doi.org/10.1016/S0370-2693(04)01365-6)

OPAL Collaboration. Constraints on anomalous quartic gauge boson couplings from $\nu\bar{\nu}\gamma\gamma$ and $q\bar{q}\gamma\gamma$ events at LEP-2. *Phys. Rev. D*, 70:032005, 2004.

OPAL Collaboration. A study of $W^+W\gamma$ events at LEP. *Phys. Lett. B*, 580:17, 2004.

OPAL Collaboration. Measurement of the $W^+W\gamma$ cross section and first direct limits on anomalous electroweak quartic gauge couplings. *Phys. Lett. B*, 471:293, 1999.

L3 Collaboration. The $e^+e^- \rightarrow Z\gamma \rightarrow q\bar{q}\gamma\gamma$ reaction at LEP and constraints on anomalous quartic gauge boson couplings. *Phys. Lett. B*, 540:43, 2002.

L3 Collaboration. Study of the $W^+W^-\gamma$ process and limits on anomalous quartic gauge boson couplings at LEP. *Phys. Lett. B*, 527:29, 2002.

DELPHI Collaboration. Measurement of the $e^+e^- \rightarrow W^+W^-\gamma$ cross section and limits on anomalous quartic gauge couplings with DELPHI. *Eur. Phys. J. C*, 31:139, 2003. <https://doi.org/10.1140/epjc/s2003-01350-x>

CMS Collaboration. Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC. *Phys. Lett. B*, 716:30, 2012.

ATLAS Collaboration. Observation of a new particle in the search for the standard model higgs boson with ATLAS detector at LHC. Phys. Lett. B, 716:1, 2012.

G. Belanger et al. Bosonic quartic couplings at LEP2. Eur. Phys. J. C, 13:283-293, 2000.
<https://doi.org/10.1007/s100520000305>

O.J.P. Eboli, M.C. Gonzalez-Garcia, S. M. Lietti. Bosonic quartic couplings at CERN LHC. Phys. Rev. D, 69: 095005, 2004. <https://doi.org/10.1103/PhysRevD.69.095005>

CMS Collaboration. Evidence for exclusive $\gamma\gamma \rightarrow W^+W^-$ production and constraints on anomalous quartic gauge couplings in pp collisions at $\sqrt{s}=7$ and 8 TeV. J. High Energy Phys., 1608:119, 2016.

CMS Collaboration. Study of exclusive two-photon production of W^+W^- in pp collisions at $\sqrt{s} = 7$ TeV and constraints on anomalous quartic gauge couplings. J. High Energy Phys., 07:116, 2013.

CMS Collaboration. Performance of CMS muon reconstruction in pp collision events at $\sqrt{s} = 7$ TeV. J. Instrum., 7:10002, 2012. <https://doi.org/10.1088/1748-0221/7/10/P10002>

CMS Collaboration. Electron reconstruction and identification at $\sqrt{s} = 7$ TeV. PAS CMS-PAS-EGM-10-004, 2010.

CMS Collaboration. Performance of electron reconstruction and selection with the CMS detector in proton-proton collisions at $\sqrt{s} = 8$ TeV. arXiv:1502.02701. <https://doi.org/10.1088/1748-0221/8/11/P11002>

J. Alwall et al. MadGraph 5 : Going beyond. arXiv:1106.0522.

G.J. Feldman, R.D. Cousins. A unified approach to the classical statistical analysis of small signals. Phys. Rev. D, 57:3873, 1998. <https://doi.org/10.1103/PhysRevD.57.3873>

ABCDHW Collaboration. The reaction pomeron-pomeron $\rightarrow \pi^+\pi^-$ and an unusual production mechanism for the $f_2(1270)$. Z. Phys. C, 48:569, 1990.

CDF Collaboration. Measurement of central exclusive $\pi^+\pi^-$ production in proton-antiproton collisions at $\sqrt{s} = 0.9$ and 1.96 TeV at CDF. Phys. Rev. D, 9:091101, 2015.

CMS Collaboration. Measurement of exclusive $\pi^+\pi^-$ production in proton-proton collisions at $\sqrt{s} = 7$ TeV. CMS PAS FSQ-12-004, 2012.

CMS Collaboration. Measurement of tracking efficiency. PAS-TRK-10-002, 2010.

J. Orear. Transverse momentum distribution of protons in p-p elastic scattering. Phys. Rev. Lett., 12:112, 1964. <https://doi.org/10.1103/PhysRevLett.12.112>

S. Klein, N. Nystrand. The STARLIGHT Monte Carlo generator. Phys. Rev. Lett., 92:142003, 2004.
<https://doi.org/10.1103/PhysRevLett.92.142003>

A. Buckley, J. Butterworth, D. Grellscheid et al. Rivet user manual. arXiv:1003.0694.

CMS Collaboration. Event generator tunes obtained from underlying event and multiparton scattering measurements. Eur. Phys. J. C, 76:155, 2016.

CMS and TOTEM Collaborations. CMS-TOTEM Precision Proton Spectrometer technical design report. CERN-LHCC-2014-021, CMS-TDR-013, TOTEM-TDR-003, 2014.