

Bibliographie de thèse

Liste des entrées dans le fichier .bib

Lucas TORTEROTOT
19 avril 2021

Références

- [1] G. AAD & coll. « Combined measurement of the Higgs boson mass in pp collisions at $\sqrt{s} = 7$ and 8 TeV with the ATLAS and CMS Experiments ». *Physical Review Letters* **114**.19 (mai 2015). DOI : [10.1103/physrevlett.114.191803](https://doi.org/10.1103/physrevlett.114.191803).
- [2] G. AAD & coll. « Measurements of the Higgs boson production and decay rates and constraints on its couplings from a combined ATLAS and CMS analysis of the LHC pp collision data at $\sqrt{s} = 7$ and 8 TeV ». *Journal of High Energy Physics* **08** (août 2016). DOI : [10.1007/jhep08\(2016\)045](https://doi.org/10.1007/jhep08(2016)045).
- [3] M. ABADI & coll. *TENSORFLOW : Large-scale machine learning on heterogeneous distributed systems*. Software available from tensorflow.org. 2015. URL : <https://www.tensorflow.org/>.
- [4] S. ABDULLIN & coll. « The Fast Simulation of the CMS Detector at LHC ». *Journal of Physics : Conference Series* **331**.3 (déc. 2011). DOI : [10.1088/1742-6596/331/3/032049](https://doi.org/10.1088/1742-6596/331/3/032049).
- [5] P. A. R. ADE & coll. « Planck 2013 results. I. Overview of products and scientific results ». *Astronomy & Astrophysics* **571** (oct. 2014). DOI : [10.1051/0004-6361/201321529](https://doi.org/10.1051/0004-6361/201321529).
- [6] S. AGOSTINELLI & coll. « GEANT4 – A simulation toolkit ». *Nuclear Instruments and Methods in Physics Research* **A506**.3 (2003), p. 250-303. DOI : [10.1016/S0168-9002\(03\)01368-8](https://doi.org/10.1016/S0168-9002(03)01368-8).
- [7] S. ALIOLI & coll. « A general framework for implementing NLO calculations in shower Monte Carlo programs : the POWHEG BOX ». *Journal of High Energy Physics* **06** (2010). DOI : [10.1007/jhep06\(2010\)043](https://doi.org/10.1007/jhep06(2010)043). arXiv : [1002.2581 \[hep-ph\]](https://arxiv.org/abs/1002.2581).
- [8] J. ALLISON & coll. « GEANT4 developments and applications ». *IEEE Transactions on Nuclear Science* **53**.1 (fév. 2006), p. 270-278. DOI : [10.1109/tns.2006.869826](https://doi.org/10.1109/tns.2006.869826).
- [9] J. ALLISON & coll. « Recent developments in GEANT4 ». *Nuclear Instruments and Methods in Physics Research* **A835** (2016), p. 186-225. DOI : [10.1016/j.nima.2016.06.125](https://doi.org/10.1016/j.nima.2016.06.125).
- [10] D. ALSPACH & H. SORENSON. « Nonlinear Bayesian estimation using Gaussian sum approximations ». *IEEE Transactions on Automatic Control* **17**.4 (1972), p. 439-448. DOI : [10.1109/TAC.1972.1100034](https://doi.org/10.1109/TAC.1972.1100034).
- [11] J. ALWALL & coll. « The automated computation of tree-level and next-to-leading order differential cross sections, and their matching to parton shower simulations ». *Journal of High Energy Physics* **07** (2014), p. 079. DOI : [10.1007/JHEP07\(2014\)079](https://doi.org/10.1007/JHEP07(2014)079). arXiv : [1405.0301 \[hep-ph\]](https://arxiv.org/abs/1405.0301).
- [12] J. ALWALL & coll. « MADGRAPH 5 : Going Beyond ». *Journal of High Energy Physics* **06** (2011). DOI : [10.1007/jhep06\(2011\)128](https://doi.org/10.1007/jhep06(2011)128). arXiv : [1106.0522 \[hep-ph\]](https://arxiv.org/abs/1106.0522).
- [13] H. L. ANDERSON & coll. « Total Cross Sections of Negative Pions in Hydrogen ». *Physical Review* **85**.5 (mar. 1952), p. 934-935. DOI : [10.1103/PhysRev.85.934.2](https://doi.org/10.1103/PhysRev.85.934.2).
- [14] H. L. ANDERSON & coll. « Total Cross Sections of Positive Pions in Hydrogen ». *Physical Review* **85**.5 (mar. 1952), p. 936. DOI : [10.1103/PhysRev.85.936](https://doi.org/10.1103/PhysRev.85.936).
- [15] B. ANDERSSON & coll. « Parton fragmentation and string dynamics » (avr. 1983). URL : <http://cds.cern.ch/record/143980>.
- [16] J. ANDREJKOVIC & coll. « BSM $H \rightarrow \tau\tau$ analysis on full Run 2 CMS data at $\sqrt{s} = 13$ TeV ». *CMS analysis Note* (2021). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2020/218.
- [17] J. ANDREJKOVIC & J. BECHTEL. « Data-driven background estimation of fake-tau backgrounds in di-tau final states with the full Run-II dataset ». *CMS analysis Note* (juin 2020). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2019/170.

- [18] J. ANDREJKOVIC & coll. « Data-driven background estimation of fake-tau backgrounds in di-tau final states with 2016 and 2017 data ». *CMS analysis Note* (oct. 2018). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2018/257.
- [19] J. ANDREJKOVIC & coll. « Measurement of Higgs(125) boson properties in decays to a pair of tau leptons with full Run II data using Machine-Learning techniques ». *CMS analysis Note* (sept. 2020). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2019/177.
- [20] J. ANDREJKOVIC & coll. « Multi-class neural network architecture and training for measurements of Higgs(125) boson decays to two tau leptons on full Run II data ». *CMS analysis Note* (mai 2020). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2019/178.
- [21] K. ANDROSOV. « DeepTau ID ». *Meeting calcolo CMS Italia*. Juin 2019. URL : https://indico.cern.ch/event/819693/contributions/3438506/attachments/1858497/3053529/2019-06-07_DeepTau_ID.pdf.
- [22] A. ARBEY & coll. « Exploring CP violation in the MSSM ». *The European Physical Journal* **C75**.85 (fév. 2015). DOI : [10.1140/epjc/s10052-015-3294-z](https://doi.org/10.1140/epjc/s10052-015-3294-z).
- [23] P. ARCE & coll. « The network of photodetectors and diode lasers of the CMS Link alignment system ». *Nuclear Instruments and Methods in Physics Research* **A896** (2018), p. 1-23. URL : <http://cds.cern.ch/record/2637152>.
- [24] C. ARMAND & coll. *JRJC 2019. Book of Proceedings*. Août 2020. URL : <https://hal.archives-ouvertes.fr/hal-02971995>.
- [25] G. ARNISON & coll. « Experimental observation of isolated large transverse energy electrons with associated missing energy at $\sqrt{s} = 540$ GeV ». *Physics Letters* **B122**.1 (1983), p. 103-116. DOI : [10.1016/0370-2693\(83\)91177-2](https://doi.org/10.1016/0370-2693(83)91177-2).
- [26] G. ARNISON & coll. « Experimental observation of lepton pairs of invariant mass around 95 GeV·c⁻² at the CERN SPS collider ». *Physics Letters* **B126**.5 (1983), p. 398-410. DOI : [10.1016/0370-2693\(83\)90188-0](https://doi.org/10.1016/0370-2693(83)90188-0).
- [27] G. ARNISON & coll. « Further evidence for charged intermediate vector bosons at the SPS collider ». *Physics Letters* **B129**.3 (1983), p. 273-282. DOI : [10.1016/0370-2693\(83\)90860-2](https://doi.org/10.1016/0370-2693(83)90860-2).
- [28] E. AŞILAR. *How to produce nanoAOD events of $h \rightarrow \tau\tau$ where Higgs has a 130 GeV mass*. URL : https://github.com/easilar/cmssw/blob/from-CMSSW_10_2_22/README.
- [29] E. AŞILAR, L. TORTEROTOT & C. BERNET. « Reconstruction of di-tau mass using deep neural networks ». *CMS analysis Note* (2021). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2021/054.
- [30] P. BAGNAIA & coll. « Evidence for $Z^0 \rightarrow e^+e^-$ at the CERN pp collider ». *Physics Letters* **B129**.1 (1983), p. 130-140. DOI : [10.1016/0370-2693\(83\)90744-X](https://doi.org/10.1016/0370-2693(83)90744-X).
- [31] E. BAGNASCHI & coll. « MSSM Higgs boson searches at the LHC : benchmark scenarios for Run 2 and beyond ». *The European Physical Journal* **C79**.7 (juil. 2019). DOI : [10.1140/epjc/s10052-019-7114-8](https://doi.org/10.1140/epjc/s10052-019-7114-8).
- [32] E. BAGNASCHI & A. VICINI. « The Higgs transverse momentum distribution in gluon fusion as a multiscale problem ». *Journal of High Energy Physics* **01** (2016). DOI : [10.1007/JHEP01\(2016\)056](https://doi.org/10.1007/JHEP01(2016)056).
- [33] E. BAGNASCHI & coll. « Resummation ambiguities in the Higgs transverse-momentum spectrum in the Standard Model and beyond ». *Journal of High Energy Physics* **01** (2016). DOI : [10.1007/JHEP01\(2016\)090](https://doi.org/10.1007/JHEP01(2016)090).
- [34] P. BALDI, P. SADOWSKI & D. WHITESON. « Enhanced Higgs Boson to $\tau^+\tau^-$ Search with Deep Learning ». *Physical Review Letters* **114**.11 (mar. 2015). DOI : [10.1103/physrevlett.114.111801](https://doi.org/10.1103/physrevlett.114.111801).
- [35] R. D. BALL & coll. « Parton distributions for the LHC Run II ». *Journal of High Energy Physics* **4** (avr. 2015). DOI : [10.1007/jhep04\(2015\)040](https://doi.org/10.1007/jhep04(2015)040).

- [36] M. BANNER & coll. « Observation of single isolated electrons of high transverse momentum in events with missing transverse energy at the CERN pp collider ». *Physics Letters* **B122.5** (1983), p. 476-485. DOI : [10.1016/0370-2693\(83\)91605-2](https://doi.org/10.1016/0370-2693(83)91605-2).
- [37] R. BARLOW & C. BEESTON. « Fitting using finite Monte Carlo samples ». *Computer Physics Communications* **77.2** (1993), p. 219-228. DOI : [10.1016/0010-4655\(93\)90005-W](https://doi.org/10.1016/0010-4655(93)90005-W).
- [38] V. E. BARNES & coll. « Observation of a Hyperon with Strangeness Minus Three ». *Physical Review Letters* **12.8** (fév. 1964), p. 204-206. DOI : [10.1103/PhysRevLett.12.204](https://doi.org/10.1103/PhysRevLett.12.204).
- [39] D. BARNEY. *Sketchup images highlighting the sub-detectors*. CMS Document Database. Nov. 2013. URL : <https://cms-docdb.cern.ch/cgi-bin/PublicDocDB/ShowDocument?docid=11982>.
- [40] A. J. BARR & coll. « Speedy Higgs boson discovery in decays to tau lepton pairs : $h \rightarrow \tau\tau$ ». *Journal of High Energy Physics* **2011.10** (oct. 2011). DOI : [10.1007/JHEP10\(2011\)080](https://doi.org/10.1007/JHEP10(2011)080).
- [41] P. BÄRTSCH & coll. « Reconstruction of τ lepton pair invariant mass using an artificial neural network ». *Nuclear Instruments and Methods in Physics Research* **A929** (2019), p. 29-33. DOI : [10.1016/j.nima.2019.03.029](https://doi.org/10.1016/j.nima.2019.03.029).
- [42] G. BELLINI, I. BIGI & P. DORNAN. « Lifetimes of charm and beauty hadrons ». *Physics Reports* **289.1** (1997), p. 1-155. DOI : [10.1016/S0370-1573\(97\)00005-7](https://doi.org/10.1016/S0370-1573(97)00005-7).
- [43] J. BELLM & coll. « HERWIG 7.0/HERWIG++ 3.0 release note ». *European Physical Journal* **C76.196** (avr. 2016). DOI : [10.1140/epjc/s10052-016-4018-8](https://doi.org/10.1140/epjc/s10052-016-4018-8).
- [44] M. BENEDIKT & coll. « The LHC Injector Chain ». *LHC Design Report. 3*. CERN Yellow Reports : Monographs. Geneva : CERN, 2004. URL : <https://cds.cern.ch/record/823808>.
- [45] J. L. BENTLEY. « Multidimensional Binary Search Trees Used for Associative Searching ». *Communications of the ACM* **18.9** (sept. 1975), p. 509-517. DOI : [10.1145/361002.361007](https://doi.org/10.1145/361002.361007).
- [46] S. BERGE, W. BERNREUTHER & S. KIRCHNER. « Prospects of constraining the Higgs boson's CP nature in the tau decay channel at the LHC ». *Physical Review* **D92** (9 nov. 2015), p. 096012. DOI : [10.1103/PhysRevD.92.096012](https://doi.org/10.1103/PhysRevD.92.096012).
- [47] S. BERGE, W. BERNREUTHER & H. SPIESBERGER. « Higgs CP properties using the τ decay modes at the ILC ». *Physics Letters* **B727.4** (2013), p. 488-495. DOI : [10.1016/j.physletb.2013.11.006](https://doi.org/10.1016/j.physletb.2013.11.006).
- [48] C. BERNET. « Caractérisation des détecteurs Micromégas et mesure de la polarisation des gluons sur COMPASS ». Thèse de doct. Paris 7 - Denis Diderot, mai 2004. URL : <http://cds.cern.ch/record/1482660>.
- [49] C. BERNET. *Heppy : a python framework for high-energy physics data analysis*. URL : <https://github.com/cbernet/heppy>.
- [50] C. BERNET. « Reconstruction du flux de particules et mise en évidence de la désintégration du boson de Higgs en paire de τ avec CMS ». Thèse d'HDR. Université Claude Bernard Lyon 1, avr. 2017. URL : <https://drive.google.com/open?id=0B3nnTYQibadjVkvVUi03cGRiYlk>.
- [51] C. BERNET. *The Data Frog – Image Recognition : Dogs vs Cats !* URL : <https://thedatafrog.com/en/articles/dogs-vs-cats/>.
- [52] D. BERTOLINI & coll. « Pileup per particle identification ». *Journal of High Energy Physics* **10** (oct. 2014). DOI : [10.1007/jhep10\(2014\)059](https://doi.org/10.1007/jhep10(2014)059).
- [53] H. A. BETHE. « Molière's Theory of Multiple Scattering ». *Physical Review* **89** (6 mar. 1953). DOI : [10.1103/PhysRev.89.1256](https://doi.org/10.1103/PhysRev.89.1256).
- [54] L. BIANCHINI & coll. « Reconstruction of the Higgs mass in $H \rightarrow \tau\tau$ Events by Dynamical Likelihood techniques ». *Journal of Physics : Conference Series* **513.2** (juin 2014). DOI : [10.1088/1742-6596/513/2/022035](https://doi.org/10.1088/1742-6596/513/2/022035).
- [55] M. BLIJ & coll. « Analysis of the Higgs CP state in τ decays ». *CMS analysis Note* (2019). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2019/192.

- [56] P. BOLZONI & coll. « Vector boson fusion at next-to-next-to-leading order in QCD : Standard model Higgs boson and beyond ». *Physical Review* **D85** (3 fév. 2012). DOI : [10.1103/PhysRevD.85.035002](https://doi.org/10.1103/PhysRevD.85.035002).
- [57] P. S. L. BOOTH. « The DELPHI Experiment ». *Philosophical Transactions : Physical Sciences and Engineering* **336**.1642 (1991), p. 213-222. URL : <http://www.jstor.org/stable/53784>.
- [58] T. BOSE & coll. « Measurement of Higgs boson production and decay to a pair of tau leptons on the full Run 2 data set using a cut-based approach ». *CMS analysis Note* (juil. 2020). URL : https://cms.cern.ch/iCMS/jsp/db_notes/noteInfo.jsp?cmsnoteid=CMS%5C%20AN-2019/109.
- [59] L. BOTTOU. « Online Algorithms and Stochastic Approximations ». *Online Learning and Neural Networks*. Sous la dir. de D. SAAD. Cambridge, UK : Cambridge University Press, 1998. URL : <http://leon.bottou.org/papers/bottou-98x>.
- [60] G. BOURGATTE. « Étude des propriétés CP du boson de Higgs dans le canal $\tau\tau$ dans l'expérience CMS auprès du LHC ». Thèse de doct. Université de Strasbourg, déc. 2020. URL : <http://cds.cern.ch/record/2750735>.
- [61] O. S. BRÜNING & coll. « The LHC Infrastructure and General Services ». *LHC Design Report. 2*. CERN Yellow Reports : Monographs. Geneva : CERN, 2004. URL : <https://cds.cern.ch/record/815187>.
- [62] O. S. BRÜNING & coll. « The LHC Main Ring ». *LHC Design Report. 1*. CERN Yellow Reports : Monographs. Geneva : CERN, 2004. URL : <https://cds.cern.ch/record/782076>.
- [63] A. BUCKLEY & coll. « General-purpose event generators for LHC physics ». *Physics Reports* **504** (jan. 2011). URL : <http://cds.cern.ch/record/1322340>.
- [64] B. BULLOCK, K. HAGIWARA & A. MARTIN. « Tau polarization and its correlations as a probe of new physics ». *Nuclear Physics* **B395**.3 (1993), p. 499-533. DOI : [10.1016/0550-3213\(93\)90045-Q](https://doi.org/10.1016/0550-3213(93)90045-Q).
- [65] N. CABIBBO. « Unitary Symmetry and Leptonic Decays ». *Physical Review Letters* **10** (12 juin 1963), p. 531-533. DOI : [10.1103/PhysRevLett.10.531](https://doi.org/10.1103/PhysRevLett.10.531).
- [66] N. CABIBBO. « Unitary Symmetry and Nonleptonic Decays ». *Physical Review Letters* **12** (2 jan. 1964), p. 62-63. DOI : [10.1103/PhysRevLett.12.62](https://doi.org/10.1103/PhysRevLett.12.62).
- [67] M. CACCIARI & G. P. SALAM. « Dispelling the N^3 myth for the k_T jet-finder ». *Physics Letters* **B641**.1 (sept. 2006), p. 57-61. DOI : [10.1016/j.physletb.2006.08.037](https://doi.org/10.1016/j.physletb.2006.08.037).
- [68] M. CACCIARI & G. P. SALAM. « Pileup subtraction using jet areas ». *Physics Letters* **B659** (jan. 2008), p. 119-126. DOI : [10.1016/j.physletb.2007.09.077](https://doi.org/10.1016/j.physletb.2007.09.077).
- [69] M. CACCIARI, G. P. SALAM & G. SOYEZ. « FASTJET user manual ». *European Physical Journal* **C72** (nov. 2012). DOI : [10.1140/epjc/s10052-012-1896-2](https://doi.org/10.1140/epjc/s10052-012-1896-2). arXiv : [1111.6097](https://arxiv.org/abs/1111.6097) [hep-ph].
- [70] M. CACCIARI, G. P. SALAM & G. SOYEZ. « The Anti- k_T jet clustering algorithm ». *Journal of High Energy Physics* **04** (avr. 2008). DOI : [10.1088/1126-6708/2008/04/063](https://doi.org/10.1088/1126-6708/2008/04/063). arXiv : [0802.1189](https://arxiv.org/abs/0802.1189) [hep-ph].
- [71] M. CARENA & coll. « CP violation in heavy MSSM Higgs scenarios ». *Journal of High Energy Physics* **2** (fév. 2016). DOI : [10.1007/jhep02\(2016\)123](https://doi.org/10.1007/jhep02(2016)123).
- [72] M. CARENA & coll. « MSSM Higgs boson searches at the LHC : benchmark scenarios after the discovery of a Higgs-like particle ». *European Physical Journal* **C73**.9 (sept. 2013). DOI : [10.1140/epjc/s10052-013-2552-1](https://doi.org/10.1140/epjc/s10052-013-2552-1).
- [73] S. CATANI & coll. « New clustering algorithm for multijet cross sections in e^+e^- annihilation ». *Physics Letters* **B269**.3 (1991), p. 432-438. DOI : [10.1016/0370-2693\(91\)90196-W](https://doi.org/10.1016/0370-2693(91)90196-W).
- [74] A. CAUCHY. « Méthode générale pour la résolution des systèmes d'équations simultanées ». *Comptes rendus hebdomadaires des séances de l'Académie des Sciences*. **25**. 1847, p. 536-538. URL : <https://gallica.bnf.fr/ark:/12148/bpt6k2982c/f3.item>.

- [75] CERN. *MapCERN*. URL : <https://maps.web.cern.ch/>.
- [76] CERN. *The first touchscreen used at CERN*. URL : <https://www.youtube.com/watch?v=tQe5dlzScwU>.
- [77] CERN. *The Higgs Discovery Explained – Ep. 1/3*. URL : <https://www.youtube.com/watch?v=so2nCu2Jkbc>.
- [78] CERN. *The Higgs Discovery Explained – Ep. 2/3*. URL : <https://www.youtube.com/watch?v=pW4LTunlXS4>.
- [79] CERN. *The Higgs Discovery Explained – Ep. 3/3*. URL : <https://www.youtube.com/watch?v=8-WFBGCvv-w>.
- [80] CERN. *The World Wide Web Project*. 1989. URL : <http://info.cern.ch/hypertext/WWW/TheProject.html>.
- [81] T. CHEN & C. GUESTRIN. « XGBOOST : A Scalable Tree Boosting System ». *Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (août 2016). DOI : [10.1145/2939672.2939785](https://doi.org/10.1145/2939672.2939785).
- [82] V. CHEREPANOV, E. RICHTER-WAS & Z. WAS. « Monte Carlo, fitting and Machine Learning for Tau leptons ». *SciPost Physics Proceedings* (1 2019), p. 18. DOI : [10.21468/SciPostPhysProc.1.018](https://doi.org/10.21468/SciPostPhysProc.1.018).
- [83] F. CHOLLET & coll. KERAS. 2015. URL : <https://keras.io>.
- [84] N. D. CHRISTENSEN, T. HAN & S. SU. « MSSM Higgs Bosons at The LHC ». *Physical Review D* **85** (2012). DOI : [10.1103/PhysRevD.85.115018](https://doi.org/10.1103/PhysRevD.85.115018). arXiv : [1203.3207](https://arxiv.org/abs/1203.3207) [hep-ph].
- [85] J. H. CHRISTENSON & coll. « Evidence for the 2π Decay of the K_2^0 Meson ». *Physical Review Letters* **13** (4 juil. 1964), p. 138-140. DOI : [10.1103/PhysRevLett.13.138](https://doi.org/10.1103/PhysRevLett.13.138).
- [86] D. CLOWE & coll. « A Direct Empirical Proof of the Existence of Dark Matter ». *Astrophysical Journal* **648.2** (août 2006). DOI : [10.1086/508162](https://doi.org/10.1086/508162).
- [87] J. S. CONWAY. « Incorporating Nuisance Parameters in Likelihoods for Multisource Spectra » (2011), p. 115-120. DOI : [10.5170/CERN-2011-006.115](https://doi.org/10.5170/CERN-2011-006.115).
- [88] *Dask : Scalable analytics in Python*. URL : <https://dask.org/>.
- [89] A. DAVIDSON & K. C. WALL. « Family mass hierarchy from universal seesaw mechanism ». *Physical Review Letters* **60** (18 mai 1988), p. 1813-1816. DOI : [10.1103/PhysRevLett.60.1813](https://doi.org/10.1103/PhysRevLett.60.1813).
- [90] S. DAWSON, A. DJOUADI & M. SPIRA. « QCD Corrections to Supersymmetric Higgs Boson Production : The Role of Squark Loops ». *Physical Review Letters* **77.1** (juil. 1996), p. 16-19. DOI : [10.1103/physrevlett.77.16](https://doi.org/10.1103/physrevlett.77.16).
- [91] DEEPMIND. *AlphaGo*. URL : <https://www.deepmind.com/research/case-studies/alphago-the-story-so-far>.
- [92] DELPHI, OPAL, ALEPH, LEP Working Group for Higgs Boson Searches, L3. « Search for neutral MSSM Higgs bosons at LEP ». *European Physical Journal C* **47** (2006), p. 547-587. DOI : [10.1140/epjc/s2006-02569-7](https://doi.org/10.1140/epjc/s2006-02569-7). arXiv : [hep-ex/0602042](https://arxiv.org/abs/hep-ex/0602042) [hep-ex].
- [93] K. DESCH & coll. « Probing the CP nature of the Higgs boson at linear colliders with τ spin correlations ; the case of mixed scalar–pseudoscalar couplings ». *Physics Letters B* **579** (jan. 2004), p. 157-164. DOI : [10.1016/j.physletb.2003.10.074](https://doi.org/10.1016/j.physletb.2003.10.074).
- [94] A. DJOUADI & coll. « The post-Higgs MSSM scenario : Habemus MSSM ? » *European Physical Journal C* **73.12** (19 juil. 2013). DOI : [10.1140/epjc/s10052-013-2650-0](https://doi.org/10.1140/epjc/s10052-013-2650-0). arXiv : [1307.5205v1](https://arxiv.org/abs/1307.5205v1) [hep-ph].
- [95] Y. L. DOKSHITZER & coll. « Better Jet Clustering Algorithms » (1997). arXiv : [hep-ph/9707323](https://arxiv.org/abs/hep-ph/9707323) [hep-ph].
- [96] A. DOMINGUEZ & coll. *CMS Technical Design Report for the Pixel Detector Upgrade*. Rapp. tech. Sept. 2012. URL : <https://cds.cern.ch/record/1481838>.

- [97] P. J. DORNAN. « The ALEPH Experiment ». *Philosophical Transactions : Physical Sciences and Engineering* **336**.1642 (1991), p. 201-211. URL : <http://www.jstor.org/stable/53783>.
- [98] J. DUCHI, E. HAZAN & Y. SINGER. « Adaptive Subgradient Methods for Online Learning and Stochastic Optimization ». *Journal of Machine Learning Research* **12**.61 (2011), p. 2121-2159. URL : <http://jmlr.org/papers/v12/duchi11a.html>.
- [99] S. DÜRR & coll. « Ab Initio Determination of Light Hadron Masses ». *Science* **322**.5905 (nov. 2008), p. 1224-1227. DOI : [10.1126/science.1163233](https://doi.org/10.1126/science.1163233).
- [100] A. ELAGIN & coll. « A new mass reconstruction technique for resonances decaying to $\tau\tau$ ». *Nuclear Instruments and Methods in Physics Research* **A654**.1 (2011), p. 481-489. DOI : [10.1016/j.nima.2011.07.009](https://doi.org/10.1016/j.nima.2011.07.009).
- [101] F. ENGLERT & R. BROUT. « Broken symmetry and the mass of gauge vector mesons ». *Physical Review Letters* **13**.9 (9 août 1964), p. 321-323. DOI : [10.1103/PhysRevLett.13.321](https://doi.org/10.1103/PhysRevLett.13.321).
- [102] J. de FAVEREAU & coll. « DELPHES 3 : a modular framework for fast simulation of a generic collider experiment ». *Journal of High Energy Physics* **2** (fév. 2014). DOI : [10.1007/jhep02\(2014\)057](https://doi.org/10.1007/jhep02(2014)057).
- [103] P. FAYET. « Spontaneously broken supersymmetric theories of weak, electromagnetic and strong interactions ». *Physics Letters* **B69**.4 (1977), p. 489-494. DOI : [10.1016/0370-2693\(77\)90852-8](https://doi.org/10.1016/0370-2693(77)90852-8).
- [104] P. FAYET. « Supergauge invariant extension of the Higgs mechanism and a model for the electron and its neutrino ». *Nuclear Physics* **B90** (1975), p. 104-124. DOI : [10.1016/0550-3213\(75\)90636-7](https://doi.org/10.1016/0550-3213(75)90636-7).
- [105] R. P. FEYNMAN. « Space-Time Approach to Quantum Electrodynamics ». *Physical Review* **76**.6 (sept. 1949), p. 769-789. DOI : [10.1103/PhysRev.76.769](https://doi.org/10.1103/PhysRev.76.769).
- [106] S. FRIXIONE, P. NASON & B. R. WEBBER. « Matching NLO QCD and parton showers in heavy flavour production ». *Journal of High Energy Physics* **8** (août 2003). DOI : [10.1088/1126-6708/2003/08/007](https://doi.org/10.1088/1126-6708/2003/08/007).
- [107] R. FRÜHWIRTH. « Application of Kalman filtering to track and vertex fitting ». *Nuclear Instruments and Methods in Physics Research* **A262**.2 (1987), p. 444-450. DOI : [10.1016/0168-9002\(87\)90887-4](https://doi.org/10.1016/0168-9002(87)90887-4).
- [108] J. GAO, L. HARLAND-LANG & J. ROJO. « The structure of the proton in the LHC precision era ». *Physics Reports* **742** (mai 2018). DOI : [10.1016/j.physrep.2018.03.002](https://doi.org/10.1016/j.physrep.2018.03.002).
- [109] M. GELL-MANN, P. RAMOND & R. SLANSKY. « Complex Spinors and Unified Theories » (1979). arXiv : [1306.4669 \[hep-th\]](https://arxiv.org/abs/1306.4669). URL : <http://cds.cern.ch/record/133618>.
- [110] A. GIAMMANCO. « The Fast Simulation of the CMS Experiment ». *Journal of Physics : Conference Series* **513**.2 (juin 2014). DOI : [10.1088/1742-6596/513/2/022012](https://doi.org/10.1088/1742-6596/513/2/022012).
- [111] S. L. GLASHOW. « Partial symmetries of weak interactions ». *Nuclear Physics* **22**.4 (1961), p. 579-588. DOI : [10.1016/0029-5582\(61\)90469-2](https://doi.org/10.1016/0029-5582(61)90469-2).
- [112] S. L. GLASHOW. « The renormalizability of vector meson interactions ». *Nuclear Physics* **10** (1959), p. 107-117. DOI : [10.1016/0029-5582\(59\)90196-8](https://doi.org/10.1016/0029-5582(59)90196-8).
- [113] X. GLOROT & Y. BENGIO. « Understanding the difficulty of training deep feedforward neural networks ». *Proceedings of the Thirteenth International Conference on Artificial Intelligence and Statistics*. Sous la dir. d'Y. W. TEH & M. TITTERINGTON. **9**. Proceedings of Machine Learning Research. PMLR, mai 2010, p. 249-256. URL : <http://proceedings.mlr.press/v9/glorot10a.html>.
- [114] Y. A. GOL'FAND & E. P. LIKHTMAN. « Extension of the algebra of Poincare group generators and violation of P invariance ». *Journal of Experimental and Theoretical Physics Letters* **13**.8 (1971), p. 323-325. URL : <http://cds.cern.ch/record/433516>.
- [115] I. GOODFELLOW, Y. BENGIO & A. COURVILLE. *Deep Learning*. MIT Press, 2016. URL : <http://www.deeplearningbook.org>.

- [116] M. GOODSSELL & F. STAUB. « The Higgs mass in the CP violating MSSM, NMSSM and beyond ». *The European Physical Journal* **C77.46** (jan. 2017). DOI : [10.1140/epjc/s10052-016-4495-9](https://doi.org/10.1140/epjc/s10052-016-4495-9).
- [117] V. GORI. « The CMS High Level Trigger ». *International Journal of Modern Physics : Conference Series* **31** (mar. 2014). URL : <https://cds.cern.ch/record/1666961>.
- [118] A. GOTTMANN. « Global Interpretation of $\tau\tau$ Events in the Context of the Standard Model and Beyond ». Thèse de doct. Fakultät für Physik des Karlsruher Instituts für Technologie (KIT), juin 2020. URL : <https://publish.etp.kit.edu/record/22014>.
- [119] B. GRIPAIOS & coll. « Reconstruction of Higgs bosons in the di-tau channel via 3-prong decay ». *Journal of High Energy Physics* **2013.3** (mar. 2013). DOI : [10.1007/JHEP03\(2013\)106](https://doi.org/10.1007/JHEP03(2013)106).
- [120] D. J. GROSS & F. WILCZEK. « Ultraviolet Behavior of Non-Abelian Gauge Theories ». *Physical Review Letters* **30** (26 juin 1973), p. 1343-1346. DOI : [10.1103/PhysRevLett.30.1343](https://doi.org/10.1103/PhysRevLett.30.1343).
- [121] D. GUEST & coll. « Jet flavor classification in high-energy physics with deep neural networks ». *Physical Review* **D94.11** (déc. 2016). DOI : [10.1103/physrevd.94.112002](https://doi.org/10.1103/physrevd.94.112002).
- [122] J. F. GUNION & coll. Errata for "The Higgs Hunter's Guide". Rapp. tech. hep-ph/9302272. Fév. 1993. URL : <https://cds.cern.ch/record/559892>.
- [123] J. F. GUNION & coll. *The Higgs hunter's guide*. T. **80**. Upton, NY : Brookhaven Nat. Lab., 1989. URL : <https://cds.cern.ch/record/425736>.
- [124] G. S. GURALNIK, C. R. HAGEN & T. W. B. KIBBLE. « Global Conservation Laws and Massless Particles ». *Physical Review Letters* **13.20** (20 nov. 1964), p. 585-587. DOI : [10.1103/PhysRevLett.13.585](https://doi.org/10.1103/PhysRevLett.13.585).
- [125] T. M. HAHN & coll. « Neutrons and Gamma-Rays from the Proton Bombardment of Beryllium ». *Physical Review* **85.5** (mar. 1952), p. 934. DOI : [10.1103/PhysRev.85.934](https://doi.org/10.1103/PhysRev.85.934).
- [126] F. J. HASERT & coll. « Observation of neutrino-like interactions without muon or electron in the Gargamelle neutrino experiment ». *Nuclear Physics* **B73.1** (1974), p. 1-22. URL : <http://cds.cern.ch/record/203096>.
- [127] F. J. HASERT & coll. « Search for elastic muon neutrino electron scattering ». *Physics Letters* **B46.1** (1973), p. 121-124. DOI : [10.1016/0370-2693\(73\)90494-2](https://doi.org/10.1016/0370-2693(73)90494-2). URL : <http://cds.cern.ch/record/243640>.
- [128] F. HASERT & coll. « Observation of neutrino-like interactions without muon or electron in the Gargamelle neutrino experiment ». *Physics Letters* **B46.1** (1973), p. 138-140. DOI : [10.1016/0370-2693\(73\)90499-1](https://doi.org/10.1016/0370-2693(73)90499-1).
- [129] P. W. HIGGS. « Broken symmetries and the masses of gauge bosons ». *Physics Letters* **13.16** (oct. 1964). DOI : [10.1103/physrevlett.13.508](https://doi.org/10.1103/physrevlett.13.508).
- [130] P. W. HIGGS. « Broken symmetries, massless particles and gauge fields ». *Physics Letters* **12.2** (sept. 1964). DOI : [10.1016/0031-9163\(64\)91136-9](https://doi.org/10.1016/0031-9163(64)91136-9).
- [131] P. W. HIGGS. « Spontaneous symmetry breakdown without massless bosons ». *Physical Review* **145** (4 mai 1966), p. 1156-1163. DOI : [10.1103/PhysRev.145.1156](https://doi.org/10.1103/PhysRev.145.1156).
- [132] G. HINTON. *Neural Networks for Machine Learning*. Coursera Video Lectures, Academic Torrents. 2012. URL : [https://archive.org/search.php?query=creator%3A%22Geoffrey+Hinton%22&\[\]=year%3A%222012%22](https://archive.org/search.php?query=creator%3A%22Geoffrey+Hinton%22&[]=year%3A%222012%22).
- [133] D. JANG. « Search for MSSM Higgs decaying to tau pairs in $p\bar{p}$ collision at $\sqrt{s} = 1,96$ TeV at CDF ». Thèse de doct. Rutgers, The State University of New Jersey, mai 2006. URL : <https://lss.fnal.gov/archive/thesis/2000/fermilab-thesis-2006-11.pdf>.
- [134] T. JUNK. « Confidence level computation for combining searches with small statistics ». *Nuclear Instruments and Methods in Physics Research* **A434.2-3** (sept. 1999), p. 435-443. DOI : [10.1016/S0168-9002\(99\)00498-2](https://doi.org/10.1016/S0168-9002(99)00498-2). arXiv : [hep-ex/9902006](https://arxiv.org/abs/hep-ex/9902006) [hep-ex].
- [135] *Kaggle Competitions*. URL : <https://www.kaggle.com/competitions>.

- [136] T. W. B. KIBBLE. « Symmetry Breaking in Non-Abelian Gauge Theories ». *Physical Review* **155** (5 mar. 1967), p. 1554-1561. DOI : [10.1103/PhysRev.155.1554](https://doi.org/10.1103/PhysRev.155.1554).
- [137] D. P. KINGMA & J. BA. « Adam : A Method for Stochastic Optimization » (2017). arXiv : [1412.6980](https://arxiv.org/abs/1412.6980) [cs.LG].
- [138] M. KOBAYASHI & T. MASKAWA. « CP-Violation in the Renormalizable Theory of Weak Interaction ». *Progress of Theoretical Physics* **49.2** (fév. 1973), p. 652-657. DOI : [10.1143/PTP.49.652](https://doi.org/10.1143/PTP.49.652).
- [139] M. KOMM. « Fast emulation of track reconstruction in the CMS simulation ». *Journal of Physics : Conference Series* **898** (oct. 2017). DOI : [10.1088/1742-6596/898/4/042034](https://doi.org/10.1088/1742-6596/898/4/042034).
- [140] T. KOPF. « Recoil Calibration as a Neural Network Task ». Mém. de mast. Fakultät für Physik des Karlsruher Instituts für Technologie (KIT), fév. 2019. URL : <https://publish.etp.kit.edu/record/21500>.
- [141] A. J. LARKOSKI. « An Unorthodox Introduction to QCD » (2017). arXiv : [1709.06195](https://arxiv.org/abs/1709.06195) [hep-ph].
- [142] H. LATTAUD. « Photon et jets avec l'expérience CMS du LHC : de la calibration à la mesure ». Thèse de doct. Université Claude Bernard Lyon 1, sept. 2019. URL : <https://tel.archives-ouvertes.fr/tel-02422226>.
- [143] *Le système international d'unités*. 9^e éd. Bureau international des poids et mesures. 2019. URL : <https://www.bipm.org/utils/common/pdf/si-brochure/SI-Brochure-9.pdf>.
- [144] LHC Higgs Cross Section Working Group. « Differential Distributions ». *Handbook of LHC Higgs Cross Sections*. **2**. CERN Yellow Reports : Monographs. Geneva : CERN, 2012. URL : <https://cds.cern.ch/record/1416519>.
- [145] LHC Higgs Cross Section Working Group. « Inclusive Observables ». *Handbook of LHC Higgs Cross Sections*. **1**. CERN Yellow Reports : Monographs. Geneva : CERN, 2011. URL : <https://cds.cern.ch/record/1318996>.
- [146] LHC Higgs Cross Section Working Group. « Deciphering the Nature of the Higgs Sector ». *Handbook of LHC Higgs Cross Sections*. **4**. CERN Yellow Reports : Monographs. Geneva : CERN, oct. 2016. URL : <http://cds.cern.ch/record/2227475>.
- [147] LHC Higgs Cross Section Working Group. « Higgs Properties ». *Handbook of LHC Higgs Cross Sections*. **3**. CERN Yellow Reports : Monographs. Geneva : CERN, 2013. URL : <https://cds.cern.ch/record/1559921>.
- [148] *Long term LHC schedule*. URL : <https://lh-commissioning.web.cern.ch/>.
- [149] E. MAJORANA. « Teoria simmetrica dell'elettrone e del positrone ». *Il Nuovo Cimento* **14**.171 (1937). DOI : [10.1007/BF02961314](https://doi.org/10.1007/BF02961314).
- [150] E. MAJORANA & L. MAIANI. « A symmetric theory of electrons and positrons ». *Ettore Majorana Scientific Papers* (2006). DOI : [10.1007/978-3-540-48095-2_10](https://doi.org/10.1007/978-3-540-48095-2_10).
- [151] Z. MAKI, M. NAKAGAWA & S. SAKATA. « Remarks on the Unified Model of Elementary Particles ». *Progress of Theoretical Physics* **28.5** (nov. 1962), p. 870-880. DOI : [10.1143/PTP.28.870](https://doi.org/10.1143/PTP.28.870).
- [152] J. MANS & coll. *CMS Technical Design Report for the Phase 1 Upgrade of the Hadron Calorimeter*. Rapp. tech. Sept. 2012. URL : <https://cds.cern.ch/record/1481837>.
- [153] S. P. MARTIN. « A Supersymmetry primer ». *Advanced Series on Directions in High Energy Physics* (juil. 1998), p. 1-98. DOI : [10.1142/9789812839657_0001](https://doi.org/10.1142/9789812839657_0001).
- [154] S. MELE. « The Measurement of the Number of Light Neutrino Species at LEP ». *Advanced Series on Directions in High Energy Physics* **23** (2015), p. 89-106. URL : <http://cds.cern.ch/record/2103251>.
- [155] A. MERTENS. « New features in DELPHES 3 ». *Journal of Physics : Conference Series* **608.1** (2015). Sous la dir. de L. FIALA, M. LOKAJICEK & N. TUMOVA. DOI : [10.1088/1742-6596/608/1/012045](https://doi.org/10.1088/1742-6596/608/1/012045).
- [156] A. MICHELINI. « OPAL Detector Performance ». *Philosophical Transactions : Physical Sciences and Engineering* **336**.1642 (1991), p. 237-246. URL : <http://www.jstor.org/stable/53786>.

- [157] M. MIR. *House Prices Prediction Using Deep Learning*. URL : <https://towardsdatascience.com/house-prices-prediction-using-deep-learning-dea265cc3154>.
- [158] R. N. MOHAPATRA & G. SENJANOVIĆ. « Neutrino Mass and Spontaneous Parity Nonconservation ». *Physical Review Letters* **44** (14 avr. 1980), p. 912-915. DOI : [10.1103/PhysRevLett.44.912](https://doi.org/10.1103/PhysRevLett.44.912).
- [159] R. N. MOHAPATRA & G. SENJANOVIĆ. « Neutrino masses and mixings in gauge models with spontaneous parity violation ». *Physical Review* **D23** (jan. 1981), p. 165-180. DOI : [10.1103/PhysRevD.23.165](https://doi.org/10.1103/PhysRevD.23.165).
- [160] L. MONETA & coll. « The RooStats Project ». *13th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT2010)*. 2010. URL : http://pos.sissa.it/archive/conferences/093/057/ACAT2010_057.pdf.
- [161] Y. NAGASHIMA. *Beyond the Standard Model of Elementary Particle Physics*. Weinheim : Wiley-VCH, juin 2014. URL : <http://cds.cern.ch/record/1620277>.
- [162] Y. NAGASHIMA. « Foundations of the Standard Model ». *Elementary Particle Physics. 2*. Weinheim : Wiley-VCH, 2013.
- [163] Y. NAGASHIMA. « Quantum Field Theory and Particles ». *Elementary Particle Physics. 1*. Weinheim : Wiley-VCH, 2010.
- [164] S. H. NEDDERMEYER & C. D. ANDERSON. « Note on the Nature of Cosmic-Ray Particles ». *Physical Review* **51** (10 mai 1937), p. 884-886. DOI : [10.1103/PhysRev.51.884](https://doi.org/10.1103/PhysRev.51.884).
- [165] B. P. NIGAM, M. K. SUNDARESAN & T.-Y. WU. « Theory of Multiple Scattering : Second Born Approximation and Corrections to Molière's Work ». *Physical Review* **115** (3 août 1959). DOI : [10.1103/PhysRev.115.491](https://doi.org/10.1103/PhysRev.115.491).
- [166] OPAL, DELPHI, LEP Working Group for Higgs boson searches, ALEPH, L3. « Search for the standard model Higgs boson at LEP ». *Physics Letters* **B565** (2003), p. 61-75. DOI : [10.1016/S0370-2693\(03\)00614-2](https://doi.org/10.1016/S0370-2693(03)00614-2). arXiv : [hep-ex/0306033](https://arxiv.org/abs/hep-ex/0306033) [hep-ex].
- [167] Particle Data Group. « Review of Particle Physics ». *Chinese Physics* **C38** (août 2014). DOI : [10.1088/1674-1137/38/9/090001](https://doi.org/10.1088/1674-1137/38/9/090001).
- [168] Particle Data Group. « Review of Particle Physics ». *Chinese Physics* **C40** (oct. 2016). DOI : [10.1088/1674-1137/40/10/100001](https://doi.org/10.1088/1674-1137/40/10/100001).
- [169] Particle Data Group. « Review of Particle Physics ». *Physical Review* **D98** (août 2018). DOI : [10.1103/PhysRevD.98.030001](https://doi.org/10.1103/PhysRevD.98.030001).
- [170] Particle Data Group. « Review of Particle Physics ». *Progress of Theoretical and Experimental Physics* **8** (août 2020). DOI : [10.1093/ptep/ptaa104](https://doi.org/10.1093/ptep/ptaa104).
- [171] H. D. POLITZER. « Reliable Perturbative Results for Strong Interactions? » *Physical Review Letters* **30** (26 juin 1973), p. 1346-1349. DOI : [10.1103/PhysRevLett.30.1346](https://doi.org/10.1103/PhysRevLett.30.1346).
- [172] A. RASPEREZA. *Recoil Corrections for the 2017 Dataset*. Oct. 2018. URL : https://indico.cern.ch/event/762837/contributions/3172618/attachments/1731302/2798220/Recoils_20181010.pdf.
- [173] S. RAYCHAUDHURI & D. P. ROY. « Charged Higgs boson search at the Fermilab Tevatron upgrade using τ polarization ». *Physical Review* **D52.3** (3 août 1995), p. 1556-1564. DOI : [10.1103/PhysRevD.52.1556](https://doi.org/10.1103/PhysRevD.52.1556).
- [174] A. L. READ. « Modified frequentist analysis of search results (the CL_s method) ». *Workshop on confidence limits, CERN, Geneva, Switzerland, 17-18 Jan 2000 : Proceedings*. CERN-OPEN-2000-205. Mai 2000. URL : <http://cds.cern.ch/record/451614>.
- [175] A. L. READ. « Presentation of search results : The $CL(s)$ technique ». *Journal of Physics* **G28.10** (sept. 2002), p. 2693-2704. DOI : [10.1088/0954-3899/28/10/313](https://doi.org/10.1088/0954-3899/28/10/313).
- [176] G. RIDOLFI, G. ROSS & F. ZWIRNER. « Supersymmetry ». *Large Hadron Collider Workshop Proceedings. II*. CERN. Geneva : CERN, oct. 1990, p. 606-683.

- [177] W. RODEJOHANN. « Neutrino-less double beta decay and particle physics ». *International Journal of Modern Physics* **E20.9** (2011). DOI : [10.1142/S0218301311020186](https://doi.org/10.1142/S0218301311020186).
- [178] J. ROJO & coll. « The PDF4LHC report on PDFs and LHC data : results from Run I and preparation for Run II ». *Journal of Physics* **G42.10** (sept. 2015). DOI : [10.1088/0954-3899/42/10/103103](https://doi.org/10.1088/0954-3899/42/10/103103).
- [179] T. SAKUMA. *3D SketchUp images of the CMS detector*. CMS Document Database. Sept. 2018. URL : <https://cms-docdb.cern.ch/cgi-bin/PublicDocDB/ShowDocument?docid=13631>.
- [180] A. SALAM & J. WARD. « Weak and electromagnetic interactions ». *Nuovo Cim* **11** (fév. 1959), p. 568-577. DOI : [10.1007/BF02726525](https://doi.org/10.1007/BF02726525).
- [181] G. P. SALAM. *Elements of QCD for hadron colliders*. 2010. arXiv : [1011.5131 \[hep-ph\]](https://arxiv.org/abs/1011.5131). URL : <https://arxiv.org/pdf/1011.5131.pdf>.
- [182] G. P. SALAM. « Towards jetography ». *European Physical Journal* **C67.3-4** (mai 2010), p. 637-686. DOI : [10.1140/epjc/s10052-010-1314-6](https://doi.org/10.1140/epjc/s10052-010-1314-6).
- [183] G. P. SALAM & G. SOYEZ. « A practical seedless infrared-safe cone jet algorithm ». *Journal of High Energy Physics* **05** (mai 2007). DOI : [10.1088/1126-6708/2007/05/086](https://doi.org/10.1088/1126-6708/2007/05/086).
- [184] W. SARLE. « Neural Networks and Statistical Models ». 1994. URL : https://people.orie.cornell.edu/davidr/or474/nn_sas.pdf.
- [185] A. SCHÄLICHE & coll. « An event generator for particle production in high-energy collisions ». *Progress in Particle and Nuclear Physics* **53.1** (2004), p. 329-338. DOI : [10.1016/j.pnpnp.2004.02.031](https://doi.org/10.1016/j.pnpnp.2004.02.031). URL : <http://www.sciencedirect.com/science/article/pii/S014664100400047X>.
- [186] M. SCHAM. « Standard Model $H \rightarrow \tau\tau$ Analysis with a Neural Network Trained on a Mix of Simulation and Data Samples ». Mém. de mast. Fakultät für Physik des Karlsruher Instituts für Technologie (KIT), juin 2020. URL : <https://publish.etp.kit.edu/record/21993>.
- [187] J. SCHECHTER & J. W. F. VALLE. « Neutrino masses in $SU(2) \times U(1)$ theories ». *Physical Review* **D22** (9 nov. 1980), p. 2227-2235. DOI : [10.1103/PhysRevD.22.2227](https://doi.org/10.1103/PhysRevD.22.2227).
- [188] J. SCHECHTER & J. W. F. VALLE. « Neutrinoless double- β decay in $SU(2) \times U(1)$ theories ». *Physical Review* **D25** (11 juin 1982), p. 2951-2954. DOI : [10.1103/PhysRevD.25.2951](https://doi.org/10.1103/PhysRevD.25.2951).
- [189] S. SEKMEN. *Recent Developments in CMS Fast Simulation*. 2017. arXiv : [1701.03850](https://arxiv.org/abs/1701.03850).
- [190] *Site internet du CERN*. URL : <https://home.cern/>.
- [191] T. SJÖSTRAND, S. MRENNA & P. SKANDS. « PYTHIA 6.4 physics and manual ». *Journal of High Energy Physics* **05** (mai 2006). DOI : [10.1088/1126-6708/2006/05/026](https://doi.org/10.1088/1126-6708/2006/05/026).
- [192] T. SJÖSTRAND, S. MRENNA & P. SKANDS. « A brief introduction to PYTHIA 8.1 ». *Computer Physics Communications* **178.11** (2008), p. 852-867. DOI : [10.1016/j.cpc.2008.01.036](https://doi.org/10.1016/j.cpc.2008.01.036).
- [193] T. SJÖSTRAND & coll. « An Introduction to PYTHIA 8.2 ». *Computer Physics Communications* **191** (2015), p. 159-177. DOI : [10.1016/j.cpc.2015.01.024](https://doi.org/10.1016/j.cpc.2015.01.024). arXiv : [1410.3012 \[hep-ph\]](https://arxiv.org/abs/1410.3012).
- [194] T. SPEER & coll. *Track Reconstruction in the CMS Tracker*. Rapp. tech. CMS-CR-2005-014. Geneva : CERN, juil. 2005. URL : <http://cds.cern.ch/record/884424>.
- [195] D. P. STICKLAND. « The L3 Experiment ». *Philosophical Transactions : Physical Sciences and Engineering* **336.1642** (1991), p. 223-236. URL : <http://www.jstor.org/stable/53785>.
- [196] A. TAPPER & D. ACOSTA. *CMS Technical Design Report for the Level-1 Trigger Upgrade*. Rapp. tech. Juin 2013. URL : <https://cds.cern.ch/record/1556311>.
- [197] The ALICE Collaboration. « The ALICE experiment at the CERN LHC. A Large Ion Collider Experiment ». *Journal of Instrumentation* **3.S08002** (2008). URL : <http://cds.cern.ch/record/1129812>.
- [198] The ATLAS Collaboration. « Search for additional heavy neutral Higgs and gauge bosons in the ditau final state produced in 36 fb^{-1} of pp collisions at $\sqrt{s} = 13\text{ TeV}$ with the ATLAS detector ». *Journal of High Energy Physics* **1** (jan. 2018). DOI : [10.1007/jhep01\(2018\)055](https://doi.org/10.1007/jhep01(2018)055).

- [199] The ATLAS Collaboration. « Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC ». *Physics Letters* **B716.1** (2012), p. 1-29. DOI : [10.1016/j.physletb.2012.08.020](https://doi.org/10.1016/j.physletb.2012.08.020).
- [200] The ATLAS Collaboration. « Search for the neutral Higgs bosons of the Minimal Supersymmetric Standard Model in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector ». *Journal of High Energy Physics* **02** (2013). DOI : [10.1007/JHEP02\(2013\)095](https://doi.org/10.1007/JHEP02(2013)095). arXiv : [1211.6956](https://arxiv.org/abs/1211.6956) [hep-ex].
- [201] The ATLAS Collaboration. « Search for Heavy Higgs Bosons Decaying into Two Tau Leptons with the ATLAS Detector Using pp Collisions at $\sqrt{s} = 13$ TeV ». *Physical Review Letters* **125** (5 juil. 2020), p. 051801. DOI : [10.1103/PhysRevLett.125.051801](https://doi.org/10.1103/PhysRevLett.125.051801).
- [202] The ATLAS Collaboration. « The ATLAS Experiment at the CERN Large Hadron Collider ». *Journal of Instrumentation* **3.S08003** (2008). URL : <http://cds.cern.ch/record/1129811>.
- [203] The ATLAS Collaboration, The CMS Collaboration, The LHC Higgs Combination Group. *Procedure for the LHC Higgs boson search combination in Summer 2011*. Rapp. tech. CMS-NOTE-2011-005. ATL-PHYS-PUB-2011-11. Geneva : CERN, août 2011. URL : <https://cds.cern.ch/record/1379837>.
- [204] The CDF Collaboration. « Search for Higgs bosons predicted in two-Higgs-doublet models via decays to tau lepton pairs in 1,96 TeV $p\bar{p}$ collisions ». *Physical Review Letters* **103** (2009). DOI : [10.1103/PhysRevLett.103.201801](https://doi.org/10.1103/PhysRevLett.103.201801). arXiv : [0906.1014](https://arxiv.org/abs/0906.1014) [hep-ex].
- [205] The CDF Collaboration. « Observation of top quark production in $p\bar{p}$ collisions with the collider detector at Fermilab ». *Physical Review Letters* **74.14** (avr. 1995), p. 2626-2631. DOI : [10.1103/physrevlett.74.2626](https://doi.org/10.1103/physrevlett.74.2626).
- [206] The CMS Collaboration. *Journal of Instrumentation* **10.06** (juin 2015). DOI : [10.1088/1748-0221/10/06/p06005](https://doi.org/10.1088/1748-0221/10/06/p06005).
- [207] The CMS Collaboration. « A measurement of the Higgs boson mass in the diphoton decay channel ». *Physics Letters* **B805** (2020), p. 135425. DOI : [10.1016/j.physletb.2020.135425](https://doi.org/10.1016/j.physletb.2020.135425).
- [208] The CMS Collaboration. « Precise mapping of the magnetic field in the CMS barrel yoke using cosmic rays ». *Journal of Instrumentation* **5** (mar. 2010). DOI : [10.1088/1748-0221/5/03/t03021](https://doi.org/10.1088/1748-0221/5/03/t03021).
- [209] The CMS Collaboration. *Baseline muon selections for Run-II*. URL : <https://twiki.cern.ch/twiki/bin/viewauth/CMS/SWGuideMuonIdRun2>.
- [210] The CMS Collaboration. « Detector Performance and Software ». *CMS Physics : Technical Design Report. 1*. Technical Design Report CMS. Geneva : CERN, 2006. URL : <http://cds.cern.ch/record/922757>.
- [211] The CMS Collaboration. *CMS TriDAS project : Technical Design Report. T. 1*. Technical Design Report CMS. Geneva : CERN. URL : <http://cds.cern.ch/record/706847>.
- [212] The CMS Collaboration. « Calibration of hadron calorimeter using isolated charged hadrons » (mai 2017). URL : <https://cds.cern.ch/record/2263758>.
- [213] The CMS Collaboration. « Description and performance of track and primary-vertex reconstruction with the CMS tracker ». *Journal of Instrumentation* **9** (mai 2014). URL : <http://cds.cern.ch/record/1704291>.
- [214] The CMS Collaboration. « Evidence for the 125 GeV Higgs boson decaying to a pair of τ leptons ». *Journal of High Energy Physics* **05** (20 jan. 2014). DOI : [10.1007/JHEP05\(2014\)104](https://doi.org/10.1007/JHEP05(2014)104). arXiv : [1401.5041v2](https://arxiv.org/abs/1401.5041v2) [hep-ex].
- [215] The CMS Collaboration. « Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC ». *Physics Letters* **B716.1** (2012), p. 30-61. DOI : [10.1016/j.physletb.2012.08.021](https://doi.org/10.1016/j.physletb.2012.08.021).
- [216] The CMS Collaboration. « Observation of a new boson with mass near 125 GeV in pp collisions at $\sqrt{s} = 7$ and 8 TeV ». *Journal of High Energy Physics* **06** (juin 2013). DOI : [10.1007/jhep06\(2013\)081](https://doi.org/10.1007/jhep06(2013)081).

- [217] The CMS Collaboration. « Search for a Higgs boson decaying into a b -quark pair and produced in association with b quarks in proton-proton collisions at 7 TeV ». *Physics Letters* **B722** (2013), p. 207-232. DOI : [10.1016/j.physletb.2013.04.017](https://doi.org/10.1016/j.physletb.2013.04.017). arXiv : [1302.2892](https://arxiv.org/abs/1302.2892) [hep-ex].
- [218] The CMS Collaboration. « Search for neutral Higgs bosons decaying to tau pairs in pp collisions at $\sqrt{s} = 7$ TeV ». *Physics Letters* **B713** (2012), p. 68-90. DOI : [10.1016/j.physletb.2012.05.028](https://doi.org/10.1016/j.physletb.2012.05.028). arXiv : [1202.4083](https://arxiv.org/abs/1202.4083) [hep-ex].
- [219] The CMS Collaboration. « The performance of the CMS muon detector in proton-proton collisions at $\sqrt{s} = 7$ TeV at the LHC ». *Journal of Instrumentation* **8** (juin 2013). URL : <https://cds.cern.ch/record/1558674>.
- [220] The CMS Collaboration. *Performance of the CMS electromagnetic calorimeter during the LHC Run II and its role in precision physics measurements*. Rapp. tech. Geneva : CERN, août 2018. URL : <https://cds.cern.ch/record/2637093>.
- [221] The CMS Collaboration. *CMS TriDAS project : Technical Design Report. T. 2*. Technical Design Report CMS. Geneva : CERN, 2002. URL : <http://cds.cern.ch/record/578006>.
- [222] The CMS Collaboration. « CMS ECAL first results with 2016 data » (juin 2016). URL : <http://cds.cern.ch/record/2194169>.
- [223] The CMS Collaboration. « CMS ECAL Response to Laser Light » (mar. 2019). URL : <https://cds.cern.ch/record/2668200>.
- [224] The CMS Collaboration. *CMS Luminosity – Public Results*. URL : <https://twiki.cern.ch/twiki/bin/view/CMSPublic/LumiPublicResults>.
- [225] The CMS Collaboration. *CMS luminosity measurement for the 2017 data-taking period at $\sqrt{s} = 13$ TeV*. Rapp. tech. CMS-PAS-LUM-17-004. Geneva : CERN, 2018. URL : <http://cds.cern.ch/record/2621960>.
- [226] The CMS Collaboration. *CMS luminosity measurement for the 2018 data-taking period at $\sqrt{s} = 13$ TeV*. Rapp. tech. CMS-PAS-LUM-18-002. Geneva : CERN, 2019. URL : <http://cds.cern.ch/record/2676164>.
- [227] The CMS Collaboration. *CMS Luminosity Measurements for the 2016 Data Taking Period*. Rapp. tech. CMS-PAS-LUM-17-001. Geneva : CERN, 2017. URL : <http://cds.cern.ch/record/2257069>.
- [228] The CMS Collaboration. « First results from the CMS SiPM-based hadronic endcap calorimeter ». Geneva, août 2018. URL : <https://cds.cern.ch/record/2636475>.
- [229] The CMS Collaboration. *DeepJet : deep learning based on physics objects for jet reconstruction*. URL : <https://twiki.cern.ch/twiki/bin/viewauth/CMS/DeepFlavour>.
- [230] The CMS Collaboration. *CMS : letter of intent by the CMS Collaboration for a general purpose detector at LHC*. Rapp. tech. CERN-LHCC-92-003. LHCC-I-1. Geneva : CERN, 1992. URL : <https://cds.cern.ch/record/290808>.
- [231] The CMS Collaboration. « Determination of jet energy calibration and transverse momentum resolution in CMS ». *Journal of Instrumentation* **6.11** (nov. 2011). DOI : [10.1088/1748-0221/6/11/p11002](https://doi.org/10.1088/1748-0221/6/11/p11002).
- [232] The CMS Collaboration. *CMS electromagnetic calorimeter calibration and timing performance during LHC Run I and future prospects*. Rapp. tech. Geneva : CERN, nov. 2014. URL : <https://cds.cern.ch/record/1975982>.
- [233] The CMS Collaboration. « The CMS Particle Flow Algorithm ». *EPJ Web of Conferences* **191** (2018). URL : <https://cds.cern.ch/record/2678077>.
- [234] The CMS Collaboration. *E/gamma Physics Object Group*. URL : <https://twiki.cern.ch/twiki/bin/view/CMS/EgammaPOG>.
- [235] The CMS Collaboration. « ECAL 2016 refined calibration and Run2 summary plots » (avr. 2020). URL : <https://cds.cern.ch/record/2717925>.

- [236] The CMS Collaboration. *Egamma Run II recommendations*. URL : <https://twiki.cern.ch/twiki/bin/view/CMS/EgammaRunIIRecommendations>.
- [237] The CMS Collaboration. « Energy calibration and resolution of the CMS electromagnetic calorimeter in pp collisions at $\sqrt{s} = 7\text{TeV}$ ». *Journal of Instrumentation* **8** (juin 2013). URL : <https://cds.cern.ch/record/1554142>.
- [238] The CMS Collaboration. *Overview of the CMS electromagnetic calorimeter*. Rapp. tech. Geneva : CERN, 1999. URL : <https://cds.cern.ch/record/421977>.
- [239] The CMS Collaboration. « HCAL Calibration in 2016 » (mai 2017). URL : <https://cds.cern.ch/record/2263759>.
- [240] The CMS Collaboration. « HCAL Calibration Status in Summer 2017 » (mai 2017). URL : <https://cds.cern.ch/record/2281146>.
- [241] The CMS Collaboration. « HCAL Energy Reconstruction Performance » (nov. 2016). URL : <https://cds.cern.ch/record/2235509>.
- [242] The CMS Collaboration. « HCAL Out Of Time Pileup Subtraction and Energy Reconstruction » (mai 2018). URL : <https://cds.cern.ch/record/2320408>.
- [243] The CMS Collaboration. « The CMS detector magnet ». *IEEE Transactions on Applied Superconductivity* **10.1** (2000). URL : <http://cds.cern.ch/record/438917>.
- [244] The CMS Collaboration. « HF and HEP17 : phase1 upgrade performances » (oct. 2017). URL : <https://cds.cern.ch/record/2288359>.
- [245] The CMS Collaboration. « Higgs to tau tau (MSSM) ». CMS-PAS-HIG-13-021 (2013). URL : <http://cds.cern.ch/record/1623367>.
- [246] The CMS Collaboration. « Identification of b-quark jets with the CMS experiment ». *Journal of Instrumentation* **8.04** (avr. 2013). DOI : [10.1088/1748-0221/8/04/p04013](https://doi.org/10.1088/1748-0221/8/04/p04013).
- [247] The CMS Collaboration. *Jet Energy Resolution*. URL : <https://twiki.cern.ch/twiki/bin/view/CMS/JetResolution>.
- [248] The CMS Collaboration. « Jet energy scale and resolution performance with 13TeV data collected by CMS in 2016 » (juin 2018). URL : <http://cds.cern.ch/record/2622157>.
- [249] The CMS Collaboration. « Jet energy scale and resolution performance with 13TeV data collected by CMS in 2016-2018 » (avr. 2020). URL : <https://cds.cern.ch/record/2715872>.
- [250] The CMS Collaboration. « Search for neutral MSSM Higgs bosons decaying to a pair of tau leptons in pp collisions ». *Journal of High Energy Physics* **10** (oct. 2014). DOI : [10.1007/jhep10\(2014\)160](https://doi.org/10.1007/jhep10(2014)160).
- [251] The CMS Collaboration. « Jet energy scale and resolution in the CMS experiment in pp collisions at 8 TeV ». *Journal of Instrumentation* **12.02** (fév. 2017). DOI : [10.1088/1748-0221/12/02/p02014](https://doi.org/10.1088/1748-0221/12/02/p02014).
- [252] The CMS Collaboration. « Event generator tunes obtained from underlying event and multiparton scattering measurements ». *European Physical Journal* **C76.3** (2016). DOI : [10.1140/epjc/s10052-016-3988-x](https://doi.org/10.1140/epjc/s10052-016-3988-x). arXiv : [1512.00815](https://arxiv.org/abs/1512.00815) [hep-ex].
- [253] The CMS Collaboration. « Performance of photon reconstruction and identification with the CMS detector in proton-proton collisions at $\sqrt{s} = 8\text{TeV}$ ». *Journal of Instrumentation* **10** (fév. 2015). URL : <https://cds.cern.ch/record/1988093>.
- [254] The CMS Collaboration. « Reconstruction and identification of tau lepton decays to hadrons and tau neutrino at CMS ». *Journal of Instrumentation* **11.1** (2016). DOI : [10.1088/1748-0221/11/01/P01019](https://doi.org/10.1088/1748-0221/11/01/P01019). arXiv : [1510.07488](https://arxiv.org/abs/1510.07488) [physics.ins-det].
- [255] The CMS Collaboration. « Search for neutral MSSM Higgs bosons decaying into a pair of bottom quarks ». *Journal of High Energy Physics* **11** (2015). DOI : [10.1007/JHEP11\(2015\)071](https://doi.org/10.1007/JHEP11(2015)071). arXiv : [1506.08329](https://arxiv.org/abs/1506.08329) [hep-ex].

- [256] The CMS Collaboration. « Search for neutral MSSM Higgs bosons decaying to $\mu^+\mu^-$ in pp collisions at $\sqrt{s} = 7$ and 8 TeV ». *Physics Letters B* **752** (2016), p. 221-246. DOI : [10.1016/j.physletb.2015.11.042](https://doi.org/10.1016/j.physletb.2015.11.042). arXiv : [1508.01437](https://arxiv.org/abs/1508.01437) [hep-ex].
- [257] The CMS Collaboration. « The CMS trigger system ». *Journal of Instrumentation* **12.1** (jan. 2017). URL : <https://cds.cern.ch/record/2212926>.
- [258] The CMS Collaboration. « CMS set of posters (En & Fr) updated 2019 » (mar. 2020). URL : <https://cds.cern.ch/record/2712624>.
- [259] The CMS Collaboration. *The Phase-1 Upgrade of the CMS Pixel Detector*. Rapp. tech. CMS-CR-2017-135. 06. Geneva : CERN, mai 2017. URL : <https://cds.cern.ch/record/2265423>.
- [260] The CMS Collaboration. *Luminosity Physics Object Group (Lumi POG)*. URL : <https://twiki.cern.ch/twiki/bin/viewauth/CMS/TWikiLUM>.
- [261] The CMS Collaboration. *Measurement of Higgs boson decay to a pair of muons in proton-proton collisions at $\sqrt{s} = 13$ TeV*. Rapp. tech. CMS-PAS-HIG-19-006. Geneva : CERN, 2020. URL : <https://cds.cern.ch/record/2725423>.
- [262] The CMS Collaboration. *Measurement of Higgs boson production and decay to the $\tau\tau$ final state*. Rapp. tech. CMS-PAS-HIG-18-032. Geneva : CERN, 2019. URL : <https://cds.cern.ch/record/2668685>.
- [263] The CMS Collaboration. « Measurement of Higgs boson production and properties in the WW decay channel with leptonic final states ». *Journal of High Energy Physics* **96** (jan. 2014). DOI : [10.1007/JHEP01\(2014\)096](https://doi.org/10.1007/JHEP01(2014)096).
- [264] The CMS Collaboration. *Measurement of Higgs boson production in the decay channel with a pair of τ leptons*. Rapp. tech. CMS-PAS-HIG-19-010. Geneva : CERN, 2020. URL : <http://cds.cern.ch/record/2725590>.
- [265] The CMS Collaboration. « Measurements of the Higgs boson width and anomalous HVV couplings from on-shell and off-shell production in the four-lepton final state ». *Physical Review D* **99** (11 juin 2019), p. 112003. DOI : [10.1103/PhysRevD.99.112003](https://doi.org/10.1103/PhysRevD.99.112003).
- [266] The CMS Collaboration. *MET Filter Recommendations for Run II*. URL : <https://twiki.cern.ch/twiki/bin/viewauth/CMS/MissingETOptionalFiltersRun2>.
- [267] The CMS Collaboration. *MET Uncertainties*. URL : https://twiki.cern.ch/twiki/bin/viewauth/CMS/MissingETRun2Corrections#MET_Uncertainties.
- [268] The CMS Collaboration. « MSSM $H/A \rightarrow \tau\tau$ search with full Run-2 data ». 2021. URL : <https://cms.cern.ch/iCMS/analysisadmin/cadilines?line=HIG-21-001&tp=an&id=2409&ancode=HIG-21-001>.
- [269] The CMS Collaboration. *MSSM Neutral Higgs*. URL : <https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHWMSSMNeutral>.
- [270] The CMS Collaboration. *Multivariate Electron Identification for Run2*. URL : <https://twiki.cern.ch/twiki/bin/view/CMS/MultivariateElectronIdentificationRun2>.
- [271] The CMS Collaboration. « Noise in Phase 1 HF detector in 2017 » (mai 2017). URL : <https://cds.cern.ch/record/2281147>.
- [272] The CMS Collaboration. « Observation of $t\bar{t}h$ Production ». *Physical Review Letters* **120** (23 juin 2018), p. 231801. DOI : [10.1103/PhysRevLett.120.231801](https://doi.org/10.1103/PhysRevLett.120.231801).
- [273] The CMS Collaboration. « Observation of the diphoton decay of the Higgs boson and measurement of its properties ». *The European Physical Journal C* **74** (oct. 2014). DOI : [10.1140/epjc/s10052-014-3076-z](https://doi.org/10.1140/epjc/s10052-014-3076-z).
- [274] The CMS Collaboration. *Performance of missing transverse momentum in pp collisions at $\sqrt{s} = 13$ TeV using the CMS detector*. Rapp. tech. Geneva : CERN, 2018. URL : <https://cds.cern.ch/record/2628600>.

- [275] The CMS Collaboration. *Performance of quark/gluon discrimination in 8 TeV pp data*. Rapp. tech. CMS-PAS-JME-13-002. Geneva : CERN, 2013. URL : <http://cds.cern.ch/record/1599732>.
- [276] The CMS Collaboration. « Performance of the DeepTau algorithm for the discrimination of taus against jets, electron, and muons » (oct. 2019). URL : <https://cds.cern.ch/record/2694158>.
- [277] The CMS Collaboration. *Pileup Removal Algorithms*. Rapp. tech. CMS-PAS-JME-14-001. Geneva : CERN, 2014. URL : <https://cds.cern.ch/record/1751454>.
- [278] The CMS Collaboration. *Properties of the Higgs-like boson in the decay $H \rightarrow ZZ \rightarrow 4\ell$ in pp collisions at $\sqrt{s} = 7$ and 8 TeV*. URL : <https://twiki.cern.ch/twiki/bin/view/CMSPublic/Hig13002TWiki>.
- [279] The CMS Collaboration. *Properties of the Higgs-like boson in the decay $H \rightarrow ZZ \rightarrow 4\ell$ in pp collisions at $\sqrt{s} = 7$ and 8 TeV*. Rapp. tech. CMS-PAS-HIG-13-002. Geneva : CERN, 2013. URL : <https://cds.cern.ch/record/1523767>.
- [280] The CMS Collaboration. *Recommendation for Using b-tag Objects in Physics Analyses*. URL : <https://twiki.cern.ch/twiki/bin/view/CMS/BtagRecommendation>.
- [281] The CMS Collaboration. « Results related to the Phase1 HE upgrade » (mai 2018). URL : <https://cds.cern.ch/record/2320857>.
- [282] The CMS Collaboration. « « ZOOM » : Drawings of the CMS detector with SketchUp » (juin 2012). URL : <https://cds.cern.ch/record/2629326>.
- [283] The CMS Collaboration. « Search for additional neutral Higgs bosons decaying to a pair of tau leptons in pp collisions at $\sqrt{s} = 7$ and 8 TeV ». CMS-PAS-HIG-14-029 (2015). URL : <https://cds.cern.ch/record/2041463>.
- [284] The CMS Collaboration. « Search for the standard model Higgs boson produced in association with a W or a Z boson and decaying to bottom quarks ». *Physical Review D* **89** (jan. 2014), p. 012003. DOI : [10.1103/PhysRevD.89.012003](https://doi.org/10.1103/PhysRevD.89.012003).
- [285] The CMS Collaboration. « An embedding technique to determine $\tau\tau$ backgrounds in proton-proton collision data ». *Journal of Instrumentation* **14.06** (juin 2019). DOI : [10.1088/1748-0221/14/06/p06032](https://doi.org/10.1088/1748-0221/14/06/p06032).
- [286] The CMS Collaboration. « Particle-flow reconstruction and global event description with the CMS detector ». *Journal of Instrumentation* **12.10** (juin 2017). DOI : [10.1088/1748-0221/12/10/P10003](https://doi.org/10.1088/1748-0221/12/10/P10003). arXiv : [1706.04965v2](https://arxiv.org/abs/1706.04965v2) [physics.ins-det].
- [287] The CMS Collaboration. « Performance of reconstruction and identification of τ leptons decaying to hadrons and ν_τ in pp collisions at $\sqrt{s} = 13$ TeV ». *Journal of Instrumentation* **13.10** (2018). DOI : [10.1088/1748-0221/13/10/P10005](https://doi.org/10.1088/1748-0221/13/10/P10005). arXiv : [1809.02816](https://arxiv.org/abs/1809.02816) [hep-ex].
- [288] The CMS Collaboration. « Performance of the CMS muon detector and muon reconstruction with proton-proton collisions at $\sqrt{s} = 13$ TeV ». *Journal of Instrumentation* **13** (avr. 2018). URL : <https://cds.cern.ch/record/2313130>.
- [289] The CMS Collaboration. « Search for additional neutral MSSM Higgs bosons in the di-tau final state in pp collisions at $\sqrt{s} = 13$ TeV ». *Journal of High Energy Physics* **09.007** (sept. 2018). DOI : [10.1007/JHEP09\(2018\)007](https://doi.org/10.1007/JHEP09(2018)007).
- [290] The CMS Collaboration. « Identification of heavy-flavour jets with the CMS detector in pp collisions at 13 TeV ». *Journal of Instrumentation* **13.05** (mai 2018). DOI : [10.1088/1748-0221/13/05/p05011](https://doi.org/10.1088/1748-0221/13/05/p05011).
- [291] The CMS Collaboration. « Observation of the Higgs boson decay to a pair of τ leptons with the CMS detector ». *Physics Letters B* **779** (avr. 2018), p. 283-316. DOI : [10.1016/j.physletb.2018.02.004](https://doi.org/10.1016/j.physletb.2018.02.004).
- [292] The CMS Collaboration. « Extraction and validation of a new set of CMS PYTHIA 8 tunes from underlying-event measurements ». *European Physical Journal C* **80** (mar. 2019). URL : <https://cds.cern.ch/record/2669320>.

- [293] The CMS Collaboration. « Measurement of differential cross sections for inclusive isolated-photon and photon+jets production in proton-proton collisions at $\sqrt{s} = 13\text{ TeV}$ ». *European Physical Journal C* **79**.20 (juil. 2018). URL : <http://cds.cern.ch/record/2628267>.
- [294] The CMS Collaboration. « Precision measurement of the structure of the CMS inner tracking system using nuclear interactions ». *Journal of Instrumentation* **13** (juil. 2018). URL : <https://cds.cern.ch/record/2629890>.
- [295] The CMS Collaboration. *Standard Model Cross Sections for CMS at 13 TeV*. URL : <https://twiki.cern.ch/twiki/bin/viewauth/CMS/StandardModelCrossSectionsat13TeV>.
- [296] The CMS Collaboration. *Studies of Tracker Material*. Rapp. tech. CMS-PAS-TRK-10-003. 2010. URL : <https://cds.cern.ch/record/1279138>.
- [297] The CMS Collaboration. *Tau ID recommendations for Run-2*. URL : <https://twiki.cern.ch/twiki/bin/viewauth/CMS/TauIDRecommendationForRun2>.
- [298] The CMS Collaboration. *The CMS electromagnetic calorimeter project : Technical Design Report*. Technical Design Report CMS. Geneva : CERN, 1997. URL : <https://cds.cern.ch/record/349375>.
- [299] The CMS Collaboration. « The CMS experiment at the CERN LHC. The Compact Muon Solenoid experiment ». *Journal of Instrumentation* **3**.S08004 (2008). URL : <http://cds.cern.ch/record/1129810>.
- [300] The CMS Collaboration. *The CMS hadron calorimeter project : Technical Design Report*. Technical Design Report CMS. Geneva : CERN, 1997. URL : <https://cds.cern.ch/record/357153>.
- [301] The CMS Collaboration. *The CMS magnet project : Technical Design Report*. Technical Design Report CMS. Geneva : CERN, 1997. URL : <http://cds.cern.ch/record/331056>.
- [302] The CMS Collaboration. *The CMS muon project : Technical Design Report*. Technical Design Report CMS. Geneva : CERN, 1997. URL : <https://cds.cern.ch/record/343814>.
- [303] The CMS Collaboration. *The CMS tracker system project : Technical Design Report*. Technical Design Report CMS. Geneva : CERN, 1997. URL : <https://cds.cern.ch/record/368412>.
- [304] The DØ Collaboration. « Observation of the top quark ». *Physical Review Letters* **74**.14 (avr. 1995), p. 2632-2637. DOI : [10.1103/physrevlett.74.2632](https://doi.org/10.1103/physrevlett.74.2632).
- [305] The DØ Collaboration. « Search for Higgs bosons decaying to $\tau\tau$ pairs in $p\bar{p}$ collisions at $\sqrt{s} = 1,96\text{ TeV}$ ». *Physics Letters B* **707** (2012), p. 323-329. DOI : [10.1016/j.physletb.2011.12.050](https://doi.org/10.1016/j.physletb.2011.12.050). arXiv : [1106.4555](https://arxiv.org/abs/1106.4555) [hep-ex].
- [306] The DØ Collaboration. « Measurement of the B^0_s lifetime in the exclusive decay channel $B^0_s \rightarrow J/\Psi\phi$ ». *Physical Review Letters* **94** (fév. 2005). DOI : [10.1103/physrevlett.94.042001](https://doi.org/10.1103/physrevlett.94.042001).
- [307] The LHCb Collaboration. « The LHCb Detector at the LHC ». *Journal of Instrumentation* **3**.S08005 (2008). URL : <http://cds.cern.ch/record/1129809>.
- [308] The LHCf Collaboration. « The LHCf detector at the CERN Large Hadron Collider ». *Journal of Instrumentation* **3**.S08006 (2008). URL : <http://cds.cern.ch/record/1129808>.
- [309] The MoEDAL Collaboration. *Technical Design Report of the MoEDAL Experiment*. Rapp. tech. CERN-LHCC-2009-006. MoEDAL-TDR-001. Juin 2009. URL : <https://cds.cern.ch/record/1181486>.
- [310] The SNO Collaboration. « Direct Evidence for Neutrino Flavor Transformation from Neutral-Current Interactions in the Sudbury Neutrino Observatory ». *Physical Review Letters* **89** (1 juin 2002). DOI : [10.1103/PhysRevLett.89.011301](https://doi.org/10.1103/PhysRevLett.89.011301).
- [311] The Super-Kamiokande Collaboration. « Evidence for oscillation of atmospheric neutrinos ». *Physical Review Letters* **81** (8 août 1998), p. 1562-1567. DOI : [10.1103/PhysRevLett.81.1562](https://doi.org/10.1103/PhysRevLett.81.1562).
- [312] The TOTEM Collaboration. « The TOTEM Experiment at the CERN Large Hadron Collider ». *Journal of Instrumentation* **3**.S08007 (2008). URL : <http://cds.cern.ch/record/1129807>.

- [313] TheCMS Collaboration. « Measurement of the properties of a Higgs boson in the four-lepton final state ». *Physical Review* **D89** (9 mai 2014), p. 092007. DOI : [10.1103/PhysRevD.89.092007](https://doi.org/10.1103/PhysRevD.89.092007).
- [314] L. TORTEROTOT. *CMSTransverseTikZ : event displays in the CMS transverse plane with TikZ*. URL : <https://gitlab.com/lucastorterotot/cmstransversetikz>.
- [315] L. TORTEROTOT. *DiTau_ML_mass – Estimations of di-tau mass using Machine Learning*. URL : https://github.com/lucastorterotot/DiTau_ML_mass.
- [316] L. TORTEROTOT. « Search for additional neutral Higgs bosons decaying to τ leptons pairs in the CMS experiment at the LHC ». *JRJC 2019. Book of Proceedings*. Août 2020, p. 53-56. URL : <https://hal.archives-ouvertes.fr/hal-02971995>.
- [317] L. TORTEROTOT, E. AŞILAR & C. BERNET. *Reconstruction of di-tau mass using Machine Learning*. URL : https://github.com/lucastorterotot/DL_for_HTT_mass.
- [318] L. TORTEROTOT, C. BERNET & E. AŞILAR. *MergeBinErrors fix on total bin error*. Fév. 2020. URL : <https://github.com/cms-analysis/CombineHarvester/pull/243>.
- [319] G. TOUQUET. « Search for an additional neutral MSSM Higgs boson decaying to tau leptons with the CMS experiment ». Thèse de doct. Université Claude Bernard Lyon 1, oct. 2019. URL : <https://hal.archives-ouvertes.fr/tel-02526393>.
- [320] S. WEINBERG. « A model of leptons ». *Physical Review Letters* **19** (21 nov. 1967), p. 1264-1266. DOI : [10.1103/PhysRevLett.19.1264](https://doi.org/10.1103/PhysRevLett.19.1264).
- [321] J. WESS & B. ZUMINO. « Supergauge transformations in four dimensions ». *Nuclear Physics* **B70.1** (1974), p. 39-50. DOI : [10.1016/0550-3213\(74\)90355-1](https://doi.org/10.1016/0550-3213(74)90355-1).
- [322] J.-C. WINTER, F. KRAUSS & G. SOFF. « A modified cluster-hadronisation model ». *European Physical Journal* **C36.3** (août 2004), p. 381-395. DOI : [10.1140/epjc/s2004-01960-8](https://doi.org/10.1140/epjc/s2004-01960-8).
- [323] M. WOBISCH & T. WENGLER. « Hadronization Corrections to Jet Cross Sections in Deep-Inelastic Scattering » (1999). arXiv : [hep-ph/9907280](https://arxiv.org/abs/hep-ph/9907280) [[hep-ph](https://arxiv.org/archive/hep)].
- [324] C. S. WU & coll. « Experimental Test of Parity Conservation in Beta Decay ». *Physical Review* **105** (4 fév. 1957), p. 1413-1415. DOI : [10.1103/PhysRev.105.1413](https://doi.org/10.1103/PhysRev.105.1413).