

# CMS Publications

June 11, 2024

- 1323 – “Search for a resonance decaying to a W boson and a photon in proton-proton collisions at  $\sqrt{s} = 13$  TeV using leptonic W boson decays”  
CMS-EXO-21-017, Submitted to JHEP, arXiv:2406.05737 (2024-06-07).
- 1322 – “Measurement of inclusive and differential cross sections for  $W^+W^-$  production in proton-proton collisions at  $\sqrt{s} = 13.6$  TeV”  
CMS-SMP-24-001, Submitted to PLB, arXiv:2406.05101 (2024-06-07).
- 1321 – “Observation of  $\gamma\gamma \rightarrow \tau\tau$  in proton-proton collisions and limits on the anomalous electromagnetic moments of the  $\tau$  lepton”  
CMS-SMP-23-005, Submitted to ROPP, arXiv:2406.03975 (2024-06-06).
- 1320 – “Observation of quantum entanglement in top quark pair production in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-23-001, Submitted to ROPP, arXiv:2406.03976 (2024-06-06).
- 1319 – “Stairway to discovery: a report on the CMS programme of cross section measurements from millibarns to femtobarns”  
CMS-SMP-23-004, Submitted to PR, arXiv:2405.18661 (2024-05-29).
- 1318 – “Search for a standard model-like Higgs boson in the mass range between 70 and 110 GeV in the diphoton final state in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-20-002, Submitted to PLB, arXiv:2405.18149 (2024-05-28).
- 1317 – “Review of searches for vector-like quarks, vector-like leptons, and heavy neutral leptons in proton-proton collisions at  $\sqrt{s} = 13$  TeV at the CMS experiment”  
CMS-EXO-23-006, Submitted to PR, arXiv:2405.17605 (2024-05-27).
- 1316 – “Study of WH production through vector boson scattering and extraction of the relative sign of the W and Z couplings to the Higgs boson in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-23-007, Submitted to PLB, arXiv:2405.16566 (2024-05-26).
- 1315 – “Searches for violation of Lorentz invariance in  $t\bar{t}$  production using dilepton events in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-22-007, Submitted to PLB, arXiv:2405.14757 (2024-05-23).
- 1314 – “Dark sector searches with the CMS experiment”  
CMS-EXO-23-005, Submitted to PR, arXiv:2405.13778 (2024-05-22).
- 1313 – “Search for CP violation in  $D^0 \rightarrow K_S^0 K_S^0$  decays in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-BPH-23-005, Submitted to EPJC, arXiv:2405.11606 (2024-05-19).
- 1312 – “Overview of high-density QCD studies with the CMS experiment at the LHC”  
CMS-HIN-23-011, Submitted to PR, arXiv:2405.10785 (2024-05-17).
- 1311 – “Search for new physics in high-mass diphoton events from proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-024, Submitted to JHEP, arXiv:2405.09320 (2024-05-15).
- 1310 – “Search for production of a single vector-like quark decaying to  $tH$  or  $tZ$  in the all-hadronic final state in pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-B2G-19-001, Submitted to PRD, arXiv:2405.05071 (2024-05-08).
- 1309 – “Girth and groomed radius of jets recoiling against isolated photons in lead-lead and proton-proton collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
CMS-HIN-23-001, Submitted to PLB, arXiv:2405.02737 (2024-05-04).

- 1308 – “Search for new resonances decaying to pairs of merged diphotons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-022, Submitted to PRL, arXiv:2405.00834 (2024-05-01).
- 1307 – “Search for the Z boson decay to  $\tau\tau\mu\mu$  in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-22-016, Submitted to PRL, arXiv:2404.18298 (2024-04-29).
- 1306 – “Performance of CMS muon reconstruction from proton-proton to heavy ion collisions”  
CMS-MUO-21-001, Submitted to JINST, arXiv:2404.17377 (2024-04-26).
- 1305 – “Measurement of multijet azimuthal correlations and determination of the strong coupling in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-22-005, Submitted to EPJC, arXiv:2404.16082 (2024-04-24).
- 1304 – “Search for Higgs boson pair production with one associated vector boson in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-22-006, Submitted to JHEP, arXiv:2404.08462 (2024-04-12).
- 1303 – “The CMS statistical analysis and combination tool: Combine”  
CMS-CAT-23-001, Submitted to CSBS, arXiv:2404.06614 (2024-04-10).
- 1302 – “Searches for pair-produced multijet resonances using data scouting in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-21-004, Submitted to PRL, arXiv:2404.02992 (2024-04-03).
- 1301 – “Measurement of differential ZZ+jets production cross sections in pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-22-001, Submitted to JHEP, arXiv:2404.02711 (2024-04-03).
- 1300 – “Search for ZZ and ZH production in the  $b\bar{b}b\bar{b}$  final state using proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-22-011, Submitted to EPJC, arXiv:2403.20241 (2024-03-29).
- 1299 – “Measurement of the production cross section of a Higgs boson with large transverse momentum in its decays to a pair of  $\tau$  leptons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-21-017, Submitted to PLB, arXiv:2403.20201 (2024-03-29).
- 1298 – “Enriching the physics program of the CMS experiment via data scouting and data parking”  
CMS-EXO-23-007, Submitted to PR, arXiv:2403.16134 (2024-03-24).
- 1297 – “Searches for Higgs boson production through decays of heavy resonances”  
CMS-B2G-23-002, Submitted to PR, arXiv:2403.16926 (2024-03-24).
- 1296 – “Performance of the CMS electromagnetic calorimeter in pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EGM-18-002, Submitted to JINST, arXiv:2403.15518 (2024-03-23).
- 1295 – “Observation of the  $J/\psi \rightarrow \mu^+\mu^-\mu^+\mu^-$  decay in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-BPH-22-006, PRD 109 (2024) L111101 (2024-06-06), arXiv:2403.11352 (2024-03-17).
- 1294 – “Search for the decay of the Higgs boson to a pair of light pseudoscalar bosons in the final state with four bottom quarks in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-18-026, Accepted by JHEP, arXiv:2403.10341 (2024-03-15).
- 1293 – “Search for Higgs boson pair production in the  $b\bar{b}W^+W^-$  decay mode in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-21-005, Submitted to JHEP, arXiv:2403.09430 (2024-03-14).
- 1292 – “Search for soft unclustered energy patterns in proton-proton collisions at 13 TeV”  
CMS-EXO-23-002, Submitted to PRL, arXiv:2403.05311 (2024-03-08).
- 1291 – “Search for long-lived heavy neutrinos in the decays of B mesons produced in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-019, Accepted by JHEP, arXiv:2403.04584 (2024-03-07).
- 1290 – “Search for new physics with emerging jets in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-015, Submitted to JHEP, arXiv:2403.01556 (2024-03-03).
- 1289 – “Review of top quark mass measurements in CMS”  
CMS-TOP-23-003, Submitted to PR, arXiv:2403.01313 (2024-03-03).

- 1288 – “Constraints on anomalous Higgs boson couplings from its production and decay using the WW channel in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-22-008, Accepted by EPJC, arXiv:2403.00657 (2024-03-01).
- 1287 – “Search for heavy neutral leptons in final states with electrons, muons, and hadronically decaying tau leptons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-011, Accepted by JHEP, arXiv:2403.00100 (2024-02-29).
- 1286 – “Search for baryon number violation in top quark production and decay using proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-22-003, Accepted by PRL, arXiv:2402.18461 (2024-01-29).
- 1285 – “Search for long-lived heavy neutral leptons decaying in the CMS muon detectors in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-017, Accepted by PRD, arXiv:2402.18658 (2024-02-28).
- 1284 – “Observation of the  $\Xi_b^- \rightarrow \psi(2S)\Xi^-$  decay and studies of the  $\Xi_b^{*0}$  baryon in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-BPH-23-002, Accepted by PRD, arXiv:2402.17738 (2024-02-27).
- 1283 – “Search for long-lived particles using displaced vertices and missing transverse momentum in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-020, PRD 109 (2024) 112005 (2024-06-05), arXiv:2402.15804 (2024-02-24).
- 1282 – “Portable acceleration of CMS computing workflows with coprocessors as a service”  
CMS-MLG-23-001, Submitted to CSBS, arXiv:2402.15366 (2024-02-23).
- 1281 – “Search for long-lived particles decaying to final states with a pair of muons in proton-proton collisions at  $\sqrt{s} = 13.6$  TeV”  
CMS-EXO-23-014, JHEP 05 (2024) 047 (2024-05-06), arXiv:2402.14491 (2024-02-22).
- 1280 – “Measurement of energy correlators inside jets and determination of the strong coupling  $\alpha_S(m_Z)$ ”  
CMS-SMP-22-015, Accepted by PRL, arXiv:2402.13864 (2024-02-21).
- 1279 – “A search for bottom-type vector-like quark pair production in dileptonic and fully hadronic final states in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-B2G-20-014, Submitted to PRD, arXiv:2402.13808 (2024-02-21).
- 1278 – “Search for exotic decays of the Higgs boson to a pair of pseudoscalars in the  $\mu\mu b\bar{b}$  and  $\tau\tau b\bar{b}$  final states”  
CMS-HIG-22-007, EPJC 84 (2024) 493 (2024-05-14), arXiv:2402.13358 (2024-02-21).
- 1277 – “Search for a scalar or pseudoscalar dilepton resonance produced in association with a massive vector boson or top quark-antiquark pair in multilepton events at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-21-018, Accepted by PRD, arXiv:2402.11098 (2024-02-16).
- 1276 – “Search for fractionally charged particles in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-19-006, Submitted to PRL, arXiv:2402.09932 (2024-02-15).
- 1275 – “Differential cross section measurements for the production of top quark pairs and of additional jets using dilepton events from pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-20-006, Submitted to JHEP, arXiv:2402.08486 (2024-02-13).
- 1274 – “Search for pair production of scalar and vector leptoquarks decaying to muons and bottom quarks in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-21-019, PRD 109 (2024) 112003 (2024-06-04), arXiv:2402.08668 (2024-02-09).
- 1273 – “Search for long-lived particles decaying in the CMS muon detectors in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-21-008, Accepted by PRD, arXiv:2402.01898 (2024-02-03).
- 1272 – “Combined search for electroweak production of winos, binos, higgsinos, and sleptons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SUS-21-008, PRD 109 (2024) 112001 (2024-06-06), arXiv:2402.01888 (2024-02-03).
- 1271 – “Observation of the  $\Lambda_b^0 \rightarrow J/\psi \Xi^- K^+$  decay”  
CMS-BPH-22-002, Submitted to EPJC, arXiv:2401.16303 (2024-01-29).

- 1270 – “Nonresonant central exclusive production of charged-hadron pairs in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-21-004, Accepted by PRD, arXiv:2401.14494 (2024-01-25).
- 1269 – “Measurement of the double-differential inclusive jet cross section in proton-proton collisions at  $\sqrt{s} = 5.02$  TeV”  
CMS-SMP-21-009, Submitted to JHEP, arXiv:2401.11355 (2024-01-21).
- 1268 – “Extracting the speed of sound in the strongly interacting matter created in ultrarelativistic lead-lead collisions at the LHC”  
CMS-HIN-23-003, Accepted by ROPP, arXiv:2401.06896 (2024-01-12).
- 1267 – “Test of lepton flavor universality in  $B^\pm \rightarrow K^\pm \mu^+ \mu^-$  and  $B^\pm \rightarrow K^\pm e^+ e^-$  decays in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-BPH-22-005, Accepted by ROPP, arXiv:2401.07090 (2024-01-12).
- 1266 – “Elliptic anisotropy measurement of the  $f_0(980)$  hadron in proton-lead collisions and evidence for its quark-antiquark composition”  
CMS-HIN-20-002, Submitted to NP, arXiv:2312.17092 (2023-12-28).
- 1265 – “Observation of enhanced long-range elliptic anisotropies inside high-multiplicity jets in pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIN-21-013, Submitted to PRL, arXiv:2312.17103 (2023-12-28).
- 1264 – “Measurement of multidifferential cross sections for dijet production in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-21-008, Submitted to EPJC, arXiv:2312.16669 (2023-12-28).
- 1263 – “Measurement of the primary Lund jet plane density in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-22-007, JHEP 05 (2024) 116 (2024-05-10), arXiv:2312.16343 (2023-12-27).
- 1262 – “Evidence for tWZ production in proton-proton collisions at  $\sqrt{s} = 13$  TeV in multilepton final states”  
CMS-TOP-22-008, Submitted to PLB, arXiv:2312.11668 (2023-12-19).
- 1261 – “Search for long-lived heavy neutral leptons with lepton flavour conserving or violating decays to a jet and a charged lepton”  
CMS-EXO-21-013, JHEP 03 (2024) 105 (2024-03-19), arXiv:2312.07484 (2023-12-12).
- 1260 – “Search for flavor changing neutral current interactions of the top quark in final states with a photon and additional jets in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-21-013, PRD 109 (2024) 072004 (2024-04-06), arXiv:2312.08229 (2023-12-11).
- 1259 – “Measurement of simplified template cross sections of the Higgs boson produced in association with W or Z bosons in the  $H \rightarrow b\bar{b}$  decay channel in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-20-001, PRD 109 (2024) 092011 (2024-05-01), arXiv:2312.07562 (2023-12-10).
- 1258 – “Search for charged-lepton flavor violation in the production and decay of top quarks using trilepton final states in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-22-005, Submitted to PRD, arXiv:2312.03199 (2023-12-05).
- 1257 – “Search for the lepton flavor violating  $\tau \rightarrow 3\mu$  decay in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-BPH-21-005, PLB 853 (2024) 138633 (2024-04-17), arXiv:2312.02371 (2023-12-04).
- 1256 – “Higher-order moments of the elliptic flow distribution in PbPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
CMS-HIN-21-010, JHEP 02 (2024) 106 (2024-02-15), arXiv:2311.11370 (2023-11-19).
- 1255 – “Search for new Higgs bosons via same-sign top quark pair production in association with a jet in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-22-010, PLB 850 (2024) 138478 (2024-02-10), arXiv:2311.03261 (2023-11-06).
- 1254 – “Search for high-mass exclusive diphoton production with tagged protons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-21-007, Accepted by PRD, arXiv:2311.02725 (2023-11-05).
- 1253 – “Search for an exotic decay of the Higgs boson into a Z boson and a pseudoscalar particle in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-22-003, PLB 852 (2024) 138582 (2024-03-18), arXiv:2311.00130 (2023-10-31).

- 1252 – “Search for W’ bosons decaying to a top and a bottom quark in leptonic final states in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-B2G-20-012, JHEP 05 (2024) 046 (2024-05-06), arXiv:2310.19893 (2023-10-30).
- 1251 – “Search for narrow trijet resonances in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-008, Accepted by PRL, arXiv:2310.14023 (2023-10-21).
- 1250 – “Search for dark matter particles in  $W^+W^-$  events with transverse momentum imbalance in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-21-012, JHEP 03 (2024) 134 (2024-03-21), arXiv:2310.12229 (2023-10-18).
- 1249 – “Search for central exclusive production of top quark pairs in proton-proton collisions at  $\sqrt{s} = 13$  TeV with tagged protons”  
CMS-TOP-21-007, Accepted by JHEP, arXiv:2310.11231 (2023-10-11).
- 1248 – “Observation of  $WW\gamma$  production and search for  $H\gamma$  production in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-22-006, PRL 132 (2024) 121901 (2024-03-19), arXiv:2310.05164 (2023-10-08).
- 1247 – “Muon identification using multivariate techniques in the CMS experiment in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-MUO-22-001, JINST 19 (2024) P02031 (2024-02-23), arXiv:2310.03844 (2023-10-05).
- 1246 – “Study of azimuthal anisotropy of  $\Upsilon(1S)$  mesons in pPb collisions at  $\sqrt{s_{NN}} = 8.16$  TeV”  
CMS-HIN-21-001, PLB 850 (2024) 138518 (2024-02-09), arXiv:2310.03233 (2023-10-05).
- 1245 – “Search for stealth supersymmetry in final states with two photons, jets, and low missing transverse momentum in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SUS-19-001, PRD 109 (2024) 112009 (2024-06-06), arXiv:2310.03154 (2023-10-05).
- 1244 – “Search for a new resonance decaying into two spin-0 bosons in a final state with two photons and two bottom quarks in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-21-011, JHEP 05 (2024) 316 (2024-05-29), arXiv:2310.01643 (2023-10-02).
- 1243 – “Search for supersymmetry in final states with disappearing tracks in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SUS-21-006, PRD 109 (2024) 072007 (2024-04-17), arXiv:2309.16823 (2023-09-28).
- 1242 – “Search for direct production of GeV-scale resonances decaying to a pair of muons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-21-005, JHEP 12 (2023) 070 (2023-12-12), arXiv:2309.16003 (2023-09-28).
- 1241 – “Combination of measurements of the top quark mass from data collected by the ATLAS and CMS experiments at  $\sqrt{s} = 7$  and 8 TeV”  
CMS-TOP-22-001, Accepted by PRL, arXiv:2402.08713 (2024-02-13).
- 1240 – “Inclusive and differential cross section measurements of  $t\bar{t}b\bar{b}$  production in the lepton+jets channel at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-22-009, JHEP 05 (2024) 042 (2024-05-06), arXiv:2309.14442 (2023-09-25).
- 1239 – “Measurement of the  $\tau$  lepton polarization in Z boson decays in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-18-010, JHEP 01 (2024) 101 (2024-01-19), arXiv:2309.12408 (2023-09-21).
- 1238 – “Development of the CMS detector for the CERN LHC Run 3”  
CMS-PRF-21-001, JINST 19 (2024) P05064 (2024-05-23), arXiv:2309.05466 (2023-09-08).
- 1237 – “Evidence for the Higgs boson decay to a Z boson and a photon at the LHC”  
CMS-HIG-23-002, PRL 132 (2024) 021803 (2024-01-11), arXiv:2309.03501 (2023-09-07).
- 1236 – “Luminosity determination using Z boson production at the CMS experiment”  
CMS-LUM-21-001, EPJC 84 (2024) 26 (2024-01-10), arXiv:2309.01008 (2023-09-02).
- 1235 – “Search for a third-generation leptoquark coupled to a  $\tau$  lepton and a b quark through single, pair, and nonresonant production in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-19-016, JHEP 05 (2024) 311 (2024-05-28), arXiv:2308.07826 (2023-08-15).

- 1234 – “Search for scalar leptoquarks produced via  $\tau$ -lepton-quark scattering in pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-018, PRL 132 (2024) 061801 (2024-02-08), arXiv:2308.06143 (2023-08-12).
- 1233 – “Measurement of the production cross section for a W boson in association with a charm quark in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-21-005, EPJC 84 (2024) 27 (2024-01-10), arXiv:2308.02285 (2023-08-04).
- 1232 – “Measurement of the Higgs boson production via vector boson fusion and its decay into bottom quarks in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-22-009, JHEP 01 (2024) 173 (2024-01-30), arXiv:2308.01253 (2023-08-02).
- 1231 – “Search for physics beyond the standard model in top quark production with additional leptons in the context of effective field theory”  
CMS-TOP-22-006, JHEP 12 (2023) 068 (2023-12-12), arXiv:2307.15761 (2023-07-28).
- 1230 – “Search for new physics in multijet events with at least one photon and large missing transverse momentum in proton-proton collisions at 13 TeV”  
CMS-SUS-21-009, JHEP 10 (2023) 046 (2023-10-06), arXiv:2307.16216 (2023-07-28).
- 1229 – “Study of charm hadronization with prompt  $\Lambda_c^+$  baryons in proton-proton and lead-lead collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
CMS-HIN-21-004, JHEP 01 (2024) 128 (2024-01-23), arXiv:2307.11186 (2023-07-20).
- 1228 – “Multiplicity and transverse momentum dependence of charge-balance functions in pPb and PbPb collisions at LHC energies”  
CMS-HIN-21-017, Submitted to JHEP, arXiv:2307.11185 (2023-07-20).
- 1227 – “Search for a high-mass dimuon resonance produced in association with b quark jets at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-22-016, JHEP 10 (2023) 043 (2023-10-06), arXiv:2307.08708 (2023-07-14).
- 1226 – “Search for Z' bosons decaying to pairs of heavy Majorana neutrinos in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-20-006, JHEP 11 (2023) 181 (2023-11-24), arXiv:2307.06959 (2023-07-13).
- 1225 – “Two-particle Bose-Einstein correlations and their Lévy parameters in PbPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
CMS-HIN-21-011, PRC 109 (2024) 024914 (2024-02-23), arXiv:2306.11574 (2023-06-20).
- 1224 – “Performance of the local reconstruction algorithms for the CMS hadron calorimeter with Run 2 data”  
CMS-PRF-22-001, JINST 18 (2023) P11017 (2023-11-22), arXiv:2306.10355 (2023-06-17).
- 1223 – “Observation of new structure in the  $J/\psi J/\psi$  mass spectrum in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-BPH-21-003, PRL 132 (2024) 111901 (2024-03-15), arXiv:2306.07164 (2023-06-12).
- 1222 – “Search for the lepton-flavor violating decay of the Higgs boson and additional Higgs bosons in the  $e\mu$  final state in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-22-002, PRD 108 (2023) 072004 (2023-10-10), arXiv:2305.18106 (2023-05-29).
- 1221 – “Measurements of the azimuthal anisotropy of prompt and nonprompt charmonia in PbPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
CMS-HIN-21-008, JHEP 10 (2023) 115 (2023-10-19), arXiv:2305.16928 (2023-05-25).
- 1220 – “Observation of four top quark production in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-22-013, PLB 847 (2023) 138290 (2023-10-31), arXiv:2305.13439 (2023-05-22).
- 1219 – “Search for inelastic dark matter in events with two displaced muons and missing transverse momentum in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-20-010, PRL 132 (2024) 041802 (2024-01-23), arXiv:2305.11649 (2023-05-19).
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- 932 – “Search for a charged Higgs boson decaying into top and bottom quarks in proton-proton collisions at  $\sqrt{s} = 13$  TeV in events with electrons or muons”  
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- 931 – “Search for supersymmetry using Higgs boson to diphoton decays at  $\sqrt{s} = 13$  TeV”  
CMS-SUS-18-007, JHEP 11 (2019) 109 (2019-12-04), arXiv:1908.08500 (2019-08-23).
- 930 – “Search for production of four top quarks in final states with same-sign or multiple leptons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 929 – “Search for supersymmetry in proton-proton collisions at 13 TeV in final states with jets and missing transverse momentum”  
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- 927 – “Measurement of the average very forward energy as a function of the track multiplicity at central pseudorapidities in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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CMS-SMP-18-008, JHEP 12 (2019) 062 (2019-12-09), arXiv:1907.08354 (2019-07-19).
- 921 – “Measurement of differential cross sections and charge ratios for  $t$ -channel single top quark production in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-17-023, EPJC 80 (2020) 370 (2020-05-06), arXiv:1907.08330 (2019-07-19).
- 920 – “Measurements of triple-differential cross sections for inclusive isolated-photon+jet events in pp collisions at  $\sqrt{s} = 8$  TeV”  
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- 919 – “Search for light pseudoscalar boson pairs produced from decays of the 125 GeV Higgs boson in final states with two muons and two nearby tracks in pp collisions at  $\sqrt{s} = 13$  TeV”  
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CMS-BPH-18-005, JHEP 12 (2019) 100 (2019-12-12), arXiv:1907.05461 (2019-07-11).
- 916 – “Measurement of the top quark polarization and  $t\bar{t}$  spin correlations using dilepton final states in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 911 – “Search for long-lived particles using nonprompt jets and missing transverse momentum with proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 910 – “A multi-dimensional search for new heavy resonances decaying to boosted WW, WZ, or ZZ boson pairs in the dijet final state at 13 TeV”  
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- 900 – “Search for anomalous electroweak production of vector boson pairs in association with two jets in proton-proton collisions at 13 TeV”  
CMS-SMP-18-006, PLB 798 (2019) 134985 (2019-11-10), arXiv:1905.07445 (2019-05-17).
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- 897 – “Multiparticle correlation studies in pPb collisions at  $\sqrt{s_{\text{NN}}} = 8.16$  TeV”  
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- 889 – “Performance of missing transverse momentum reconstruction in proton-proton collisions at  $\sqrt{s} = 13$  TeV using the CMS detector”  
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- 886 – “An embedding technique to determine  $\tau\tau$  backgrounds in proton-proton collision data”  
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CMS-HIN-17-006, PLB 799 (2019) 135049 (2019-12-10), arXiv:1902.03603 (2019-02-10).
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CMS-FSQ-16-007, EPJC 79 (2019) 702 (2019-08-21), arXiv:1902.01339 (2019-02-05).
- 880 – “Observation of two excited  $B_c^+$  states and measurement of the  $B_c^+(2S)$  mass in pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-BPH-18-007, PRL 122 (2019) 132001 (2019-04-03), arXiv:1902.00571 (2019-02-01).
- 879 – “Search for W boson decays to three charged pions”  
CMS-SMP-18-009, PRL 122 (2019) 151802 (2019-04-19), arXiv:1901.11201 (2019-01-30).
- 878 – “Charged-particle angular correlations in XeXe collisions at  $\sqrt{s_{NN}} = 5.44$  TeV”  
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- 877 – “Search for supersymmetry in events with a photon, jets, b-jets, and missing transverse momentum in proton-proton collisions at 13 TeV”  
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- 875 – “Measurements of the  $pp \rightarrow WZ$  inclusive and differential production cross section and constraints on charged anomalous triple gauge couplings at  $\sqrt{s} = 13$  TeV”  
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CMS-HIG-18-002, PRD 99 (2019) 112003 (2019-06-12), arXiv:1901.00174 (2019-01-01).
- 871 – “Measurement of the  $t\bar{t}$  production cross section, the top quark mass, and the strong coupling constant using dilepton events in pp collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-17-001, EPJC 79 (2019) 368 (2019-04-29), arXiv:1812.10505 (2018-12-27).
- 870 – “Measurement of the differential Drell-Yan cross section in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-17-001, JHEP 12 (2019) 059 (2019-12-09), arXiv:1812.10529 (2018-12-27).
- 869 – “Measurement of the top quark mass in the all-jets final state at  $\sqrt{s} = 13$  TeV and combination with the lepton+jets channel”  
CMS-TOP-17-008, EPJC 79 (2019) 313 (2019-04-06), arXiv:1812.10534 (2018-12-27).
- 868 – “Search for contact interactions and large extra dimensions in the dilepton mass spectra from proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 865 – “Measurement and interpretation of differential cross sections for Higgs boson production at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-17-028, PLB 792 (2019) 369 (2019-05-10), arXiv:1812.06504 (2018-12-16).
- 864 – “Search for a heavy resonance decaying to a top quark and a vector-like top quark in the lepton+jets final state in pp collisions at  $\sqrt{s} = 13$  TeV”  
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CMS-SUS-16-017, JHEP 03 (2019) 031 (2019-03-06), arXiv:1812.06302 (2018-12-15).
- 862 – “Search for an exotic decay of the Higgs boson to a pair of light pseudoscalars in the final state with two muons and two b quarks in pp collisions at 13 TeV”  
CMS-HIG-18-011, PLB 795 (2019) 398 (2019-08-10), arXiv:1812.06359 (2018-12-15).
- 861 – “Observation of single top quark production in association with a Z boson in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-TOP-18-008, PRL 122 (2019) 132003 (2019-04-06), arXiv:1812.05900 (2018-12-14).
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- 859 – “Measurement of the energy density as a function of pseudorapidity in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-FSQ-15-006, EPJC 79 (2019) 391 (2019-05-07), arXiv:1812.04095 (2018-12-10).
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CMS-FSQ-17-001, JHEP 05 (2019) 043 (2019-05-07), arXiv:1812.01691 (2018-12-04).
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CMS-SMP-17-014, EPJC 79 (2019) 269 (2019-03-23), arXiv:1811.10021 (2018-11-26).
- 855 – “Search for dark matter in events with a leptoquark and missing transverse momentum in proton-proton collisions at 13 TeV”  
CMS-EXO-17-015, PLB 795 (2019) 76 (2019-08-10), arXiv:1811.10151 (2018-11-26).
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CMS-SUS-17-008, EPJC 79 (2019) 305 (2019-04-04), arXiv:1811.09760 (2018-11-24).
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CMS-HIG-18-009, PRD 99 (2019) 092005 (2019-05-21), arXiv:1811.09696 (2018-11-23).
- 852 – “Combination of searches for Higgs boson pair production in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-17-030, PRL 122 (2019) 121803 (2019-03-30), arXiv:1811.09689 (2018-11-23).
- 851 – “Search for a standard model-like Higgs boson in the mass range between 70 and 110 GeV in the diphoton final state in proton-proton collisions at  $\sqrt{s} = 8$  and 13 TeV”  
CMS-HIG-17-013, PLB 793 (2019) 320 (2019-06-10), arXiv:1811.08459 (2018-11-20).
- 850 – “Search for long-lived particles decaying into displaced jets in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-18-007, PRD 99 (2019) 032011 (2019-02-22), arXiv:1811.07991 (2018-11-19).
- 849 – “Search for a W’ boson decaying to a vector-like quark and a top or bottom quark in the all-jets final state”  
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CMS-EXO-16-050, EPJC 79 (2019) 280 (2019-03-27), arXiv:1811.06562 (2018-11-16).
- 847 – “Measurements of  $t\bar{t}$  differential cross sections in proton-proton collisions at  $\sqrt{s} = 13$  TeV using events containing two leptons”  
CMS-TOP-17-014, JHEP 02 (2019) 149 (2019-02-22), arXiv:1811.06625 (2018-11-17).
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- 845 – “Search for pair production of first-generation scalar leptoquarks at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-17-009, PRD 99 (2019) 052002 (2019-03-16), arXiv:1811.01197 (2018-11-03).
- 844 – “Search for heavy neutrinos and third-generation leptoquarks in hadronic states of two  $\tau$  leptons and two jets in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 843 – “Event shape variables measured using multijet final states in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-17-003, JHEP 12 (2018) 117 (2018-12-19), arXiv:1811.00588 (2018-11-02).
- 842 – “Search for nonresonant Higgs boson pair production in the  $b\bar{b}b\bar{b}$  final state at  $\sqrt{s} = 13$  TeV”  
CMS-HIG-17-017, JHEP 04 (2019) 112 (2019-04-17), arXiv:1810.11854 (2018-10-29).
- 841 – “Search for low-mass resonances decaying into bottom quark-antiquark pairs in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-EXO-17-024, PRD 99 (2019) 012005 (2018-11-26), arXiv:1810.11822 (2018-10-28).
- 840 – “Studies of beauty suppression via nonprompt  $D^0$  mesons in PbPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
CMS-HIN-16-016, PRL 123 (2019) 022001 (2019-07-10), arXiv:1810.11102 (2018-10-25).
- 839 – “Search for pair-produced three-jet resonances in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 837 – “Search for rare decays of Z and Higgs bosons to  $J/\psi$  and a photon in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
CMS-SMP-17-012, EPJC 79 (2019) 94 (2019-01-30), arXiv:1810.10056 (2018-10-23).
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- 835 – “Centrality and pseudorapidity dependence of the transverse energy density in pPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
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- 833 – “Search for top quark partners with charge  $5/3$  in the same-sign dilepton and single-lepton final states in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 821 – “Performance of reconstruction and identification of  $\tau$  leptons decaying to hadrons and  $\nu_\tau$  in pp collisions at  $\sqrt{s} = 13$  TeV”  
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- 817 – “Measurement of jet substructure observables in  $t\bar{t}$  events from proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 779 – “Observation of the  $\chi_{b1}(3P)$  and  $\chi_{b2}(3P)$  and measurement of their masses”  
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- 777 – “Search for an exotic decay of the Higgs boson to a pair of light pseudoscalars in the final state with two b quarks and two  $\tau$  leptons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 463 – “Measurement of the inelastic cross section in proton-lead collisions at  $\sqrt{s_{NN}} = 5.02$  TeV”  
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- 452 – “Angular analysis of the decay  $B^0 \rightarrow K^{*0}\mu^+\mu^-$  from pp collisions at  $\sqrt{s} = 8$  TeV”  
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- 451 – “Measurement of the CP-violating weak phase  $\phi_s$  and the decay width difference  $\Delta\Gamma_s$  using the  $B_s^0 \rightarrow J/\psi\phi(1020)$  decay channel in pp collisions at  $\sqrt{s} = 8$  TeV”  
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- 449 – “Search for pair-produced vectorlike B quarks in proton-proton collisions at  $\sqrt{s} = 8$  TeV”  
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- 447 – “Pseudorapidity distribution of charged hadrons in proton-proton collisions at  $\sqrt{s} = 13$  TeV”  
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- 445 – “Inclusive and differential measurements of the  $t\bar{t}$  charge asymmetry in pp collisions at  $\sqrt{s} = 8$  TeV”  
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- 444 – “Search for a Higgs boson decaying into  $\gamma^*\gamma \rightarrow \ell\ell\gamma$  with low dilepton mass in pp collisions at  $\sqrt{s} = 8$  TeV”  
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- 441 – “Production of leading charged particles and leading charged-particle jets at small transverse momenta in pp collisions at  $\sqrt{s} = 8$  TeV”  
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