

Papers by Arsen Khvedelidze

1. **“Search for supersymmetry using Higgs boson to diphoton decays at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1908.08500 [hep-ex]
CMS-SUS-18-007, CERN-EP-2019-171
2. **“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”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1908.06463 [hep-ex]
CMS-TOP-18-003, CERN-EP-2019-163
3. **“Search for supersymmetry in proton-proton collisions at 13 TeV in final states with jets and missing transverse momentum”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1908.04722 [hep-ex]
CMS-SUS-19-006, CERN-EP-2019-152
4. **“Search for dark matter particles produced in association with a Higgs boson in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1908.01713 [hep-ex]
CMS-EXO-18-011, CERN-EP-2019-141
5. **“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”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1908.01750 [hep-ex]
CMS-FSQ-18-001, CERN-EP-2019-146
6. **“Search for heavy Higgs bosons decaying to a top quark pair in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1908.01115 [hep-ex]
CMS-HIG-17-027, CERN-EP-2019-147
7. **“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”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1907.07235 [hep-ex]
CMS-HIG-18-006, CERN-EP-2019-105
8. **“Search for physics beyond the standard model in events with overlapping photons and jets”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1907.06275 [hep-ex]
FERMILAB-PUB-19-427-CMS, CMS-B2G-18-007, CERN-EP-2019-135
9. **“Search for MSSM Higgs bosons decaying to $\mu^+\mu^-$ in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].

arXiv:1907.03152 [hep-ex]
CMS-HIG-18-010, CERN-EP-2019-109

10. **“Combined search for supersymmetry with photons in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1907.00857 [hep-ex]
CMS-SUS-18-005, CERN-EP-2019-114
11. **“Search for long-lived particles using nonprompt jets and missing transverse momentum with proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1906.06441 [hep-ex]
CMS-EXO-19-001, CERN-EP-2019-113
12. **“Production of Λ_c^+ baryons in proton-proton and lead-lead collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1906.03322 [hep-ex]
CMS-HIN-18-009, CERN-EP-2019-102
13. **“Search for the Production of Four Top Quarks in the Single-Lepton and Opposite-Sign Dilepton Final States in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1906.02805 [hep-ex]
CERN-EP-2019-098
14. **“Search for supersymmetry with a compressed mass spectrum in the vector boson fusion topology with 1-lepton and 0-lepton final states in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1905.13059 [hep-ex]
CMS-SUS-17-007, CERN-EP-2019-093
15. **“Search for Higgs and Z boson decays to J/ψ or Υ pairs in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1905.10408 [hep-ex]
CMS-HIG-18-025, CERN-EP-2019-082
16. **“Search for anomalous electroweak production of vector boson pairs in association with two jets in proton-proton collisions at 13 TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1905.07445 [hep-ex]
CMS-SMP-18-006, CERN-EP-2019-089
17. **“Search for a light charged Higgs boson decaying to a W boson and a CP-odd Higgs boson in final states with $e\mu\mu$ or $\mu\mu\mu$ in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1905.07453 [hep-ex]
CMS-HIG-18-020, CERN-EP-2019-083
18. **“Search for the production of $W^\pm W^\pm W^\mp$ events at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1905.04246 [hep-ex]
DOI:10.1103/PhysRevD.100.012004
Phys. Rev. D **100**, no. 1, 012004 (2019)
CMS-SMP-17-013, CERN-EP-2019-074
19. **“Observation of nuclear modifications in $W^\pm$ boson production in pPb collisions at $\sqrt{s_{NN}} = 8.16$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].

- arXiv:1905.01486 [hep-ex]
CMS-HIN-17-007, CERN-EP-2018-283
20. **“Measurement of $t\bar{t}$ normalised multi-differential cross sections in pp collisions at $\sqrt{s} = 13$ TeV, and simultaneous determination of the strong coupling strength, top quark pole mass, and parton distribution functions”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1904.05237 [hep-ex]

CMS-TOP-18-004, CERN-EP-2019-028
 21. **“Search for supersymmetry in final states with photons and missing transverse momentum in proton-proton collisions at 13 TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1903.07070 [hep-ex]
DOI:10.1007/JHEP06(2019)143
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CMS-SUS-17-011, CERN-EP-2019-040
 22. **“Constraints on anomalous HVV couplings from the production of Higgs bosons decaying to τ lepton pairs”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1903.06973 [hep-ex]

CMS-HIG-17-034, CERN-EP-2019-029
 23. **“An embedding technique to determine $\tau\tau$ backgrounds in proton-proton collision data”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1903.01216 [hep-ex]
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JINST **14**, no. 06, P06032 (2019)
CMS-TAU-18-001, CERN-EP-2019-012
 24. **“On Mechanizm Of ϕ e Conversion Induced by Dark Matter”**
S. Gogilidze and A. Khvedelidze.
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 25. **“Azimuthal separation in nearly back-to-back jet topologies in inclusive 2- and 3-jet events in pp collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1902.04374 [hep-ex]
CMS-SMP-17-009, CERN-EP-2018-344
 26. **“Pseudorapidity distributions of charged hadrons in xenon-xenon collisions at $\sqrt{s_{NN}} = 5.44$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1902.03603 [hep-ex]
CMS-HIN-17-006, CERN-EP-2018-294
 27. **“Measurement of exclusive $\rho(770)^0$ photoproduction in ultraperipheral pPb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1902.01339 [hep-ex]
CMS-FSQ-16-007, CERN-EP-2018-285
 28. **“Charged-particle angular correlations in XeXe collisions at $\sqrt{s_{NN}} = 5.44$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1901.07997 [hep-ex]

CMS-HIN-18-001, CERN-EP-2018-345

29. **“Measurements of the Higgs boson width and anomalous HVV couplings from on-shell and off-shell production in the four-lepton final state”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1901.00174 [hep-ex]
DOI:10.1103/PhysRevD.99.112003
Phys. Rev. D **99**, no. 11, 112003 (2019)
CMS-HIG-18-002, CERN-EP-2018-329
30. **“Search for dark matter produced in association with a single top quark or a top quark pair in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1901.01553 [hep-ex]
DOI:10.1007/JHEP03(2019)141
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CMS-EXO-18-010, CERN-EP-2018-311
31. **“Search for the pair production of light top squarks in the $e^{\pm}\mu^{\mp}$ final state in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1901.01288 [hep-ex]
DOI:10.1007/JHEP03(2019)101
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CMS-SUS-18-003, CERN-EP-2018-312
32. **“Measurement of the top quark mass in the all-jets final state at $\sqrt{s} = 13$ TeV and combination with the lepton+jets channel”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1812.10534 [hep-ex]
DOI:10.1140/epjc/s10052-019-6788-2
Eur. Phys. J. C **79**, no. 4, 313 (2019)
CMS-TOP-17-008, CERN-EP-2018-310
33. **“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”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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Eur. Phys. J. C **79**, no. 5, 368 (2019)
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34. **“COMET Phase-I Technical Design Report”**
G. Adamov *et al.* [COMET Collaboration].
arXiv:1812.09018 [physics.ins-det]
35. **“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”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1812.06489 [hep-ex]
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CMS-B2G-17-015, CERN-EP-2018-313
36. **“Measurement and interpretation of differential cross sections for Higgs boson production at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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DOI:10.1016/j.physletb.2019.03.059
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37. **“Inclusive search for supersymmetry in pp collisions at $\sqrt{s} = 13$ TeV using razor variables and boosted object identification in zero and one lepton final states”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1812.06302 [hep-ex]
DOI:10.1007/JHEP03(2019)031
JHEP **1903**, 031 (2019)
CMS-SUS-16-017, CERN-EP-2018-307
38. **“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”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1812.06359 [hep-ex]
DOI:10.1016/j.physletb.2019.06.021
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CMS-HIG-18-011, CERN-EP-2018-309
39. **“Observation of Single Top Quark Production in Association with a Z Boson in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1812.05900 [hep-ex]
DOI:10.1103/PhysRevLett.122.132003
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CMS-TOP-18-008, CERN-EP-2018-328
40. **“Search for supersymmetry in events with a photon, a lepton, and missing transverse momentum in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1812.04066 [hep-ex]
DOI:10.1007/JHEP01(2019)154
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CMS-SUS-17-012, CERN-EP-2018-277
41. **“A search for pair production of new light bosons decaying into muons in proton-proton collisions at 13 TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1812.00380 [hep-ex]
DOI:10.1016/j.physletb.2019.07.013
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CMS-HIG-18-003, CERN-EP-2018-288
42. **“Search for resonant production of second-generation sleptons with same-sign dimuon events in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1811.09760 [hep-ex]
DOI:10.1140/epjc/s10052-019-6800-x
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CMS-SUS-17-008, CERN-EP-2018-297
43. **“Search for associated production of a Higgs boson and a single top quark in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1811.09696 [hep-ex]
DOI:10.1103/PhysRevD.99.092005
Phys. Rev. D **99**, no. 9, 092005 (2019)
CMS-HIG-18-009, CERN-EP-2018-305
44. **“Combination of searches for Higgs boson pair production in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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45. **“Measurements of $t\bar{t}$ differential cross sections in proton-proton collisions at $\sqrt{s} = 13$ TeV using events containing two leptons”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1811.06625 [hep-ex]
DOI:10.1007/JHEP02(2019)149
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CMS-TOP-17-014, CERN-EP-2018-252
46. **“Search for dark matter produced in association with a Higgs boson decaying to a pair of bottom quarks in protonproton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1811.06562 [hep-ex]
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CMS-EXO-16-050, CERN-EP-2018-287
47. **“Search for nonresonant Higgs boson pair production in the $b\bar{b}b\bar{b}$ final state at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1810.11854 [hep-ex]
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CMS-HIG-17-017, CERN-EP-2018-269
48. **“Search for rare decays of Z and Higgs bosons to J/ψ and a photon in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1810.10056 [hep-ex]
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49. **“Search for new particles decaying to a jet and an emerging jet”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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CMS-EXO-18-001, CERN-EP-2018-255
50. **“Search for resonant $t\bar{t}$ production in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1810.05905 [hep-ex]
DOI:10.1007/JHEP04(2019)031
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51. **“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”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1810.03188 [hep-ex]
DOI:10.1007/JHEP03(2019)082
JHEP **1903**, 082 (2019)
CMS-B2G-17-014, CERN-EP-2018-258
52. **“Combined measurements of Higgs boson couplings in protonproton collisions at $\sqrt{s} = 13$ TeV”**

- A. M. Sirunyan *et al.* [CMS Collaboration].
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53. **“Search for single production of vector-like quarks decaying to a top quark and a W boson in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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54. **“Search for invisible decays of a Higgs boson produced through vector boson fusion in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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55. **“Search for physics beyond the standard model in high-mass diphoton events from proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1809.00327 [hep-ex]
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Phys. Rev. D **98**, no. 9, 092001 (2018)
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56. **“Observation of Higgs boson decay to bottom quarks”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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Phys. Rev. Lett. **121**, no. 12, 121801 (2018)
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57. **“Search for a charged Higgs boson decaying to charm and bottom quarks in proton-proton collisions at $\sqrt{s} = 8$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1808.06575 [hep-ex]
DOI:10.1007/JHEP11(2018)115
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CMS-HIG-16-030, CERN-EP-2018-121
58. **“Evidence for the associated production of a single top quark and a photon in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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59. **“Search for pair-produced resonances decaying to quark pairs in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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60. **“Search for production of Higgs boson pairs in the four b quark final state using large-area jets in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1808.01473 [hep-ex]
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CMS-B2G-17-019, CERN-EP-2018-195
61. **“Search for resonances in the mass spectrum of muon pairs produced in association with b quark jets in proton-proton collisions at $\sqrt{s} = 8$ and 13 TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1808.01890 [hep-ex]
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CMS-HIG-16-017, CERN-EP-2018-204
62. **“Search for a W’ boson decaying to a τ lepton and a neutrino in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
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63. **“Searches for pair production of charginos and top squarks in final states with two oppositely charged leptons in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1807.07799 [hep-ex]
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64. **“Search for dark matter particles produced in association with a top quark pair at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
arXiv:1807.06522 [hep-ex]
DOI:10.1103/PhysRevLett.122.011803
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65. **“Search for the Higgs boson decaying to two muons in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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66. **“Measurements of the differential jet cross section as a function of the jet mass in dijet events from proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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67. **“Measurement of inclusive and differential Higgs boson production cross sections in the diphoton decay channel in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
A. M. Sirunyan *et al.* [CMS Collaboration].
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68. **“Search for heavy resonances decaying into a vector boson and a Higgs boson in final states with charged leptons, neutrinos and b quarks at $\sqrt{s} = 13$ TeV”**
 A. M. Sirunyan *et al.* [CMS Collaboration].
 arXiv:1807.02826 [hep-ex]
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 CMS-B2G-17-004, CERN-EP-2018-169
69. **“Study of the underlying event in top quark pair production in pp collisions at 13 TeV”**
 A. M. Sirunyan *et al.* [CMS Collaboration].
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 CMS-TOP-17-015, CERN-EP-2018-177
70. **“Search for supersymmetry in events with a τ lepton pair and missing transverse momentum in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
 A. M. Sirunyan *et al.* [CMS Collaboration].
 arXiv:1807.02048 [hep-ex]
 DOI:10.1007/JHEP11(2018)151
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 CMS-SUS-17-003, CERN-EP-2018-149
71. **“Measurement of charged particle spectra in minimum-bias events from proton-proton collisions at $\sqrt{s} = 13$ TeV”**
 A. M. Sirunyan *et al.* [CMS Collaboration].
 arXiv:1806.11245 [hep-ex]
 DOI:10.1140/epjc/s10052-018-6144-y
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 CMS-FSQ-16-011, CERN-EP-2018-187
72. **“Search for heavy Majorana neutrinos in same-sign dilepton channels in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
 A. M. Sirunyan *et al.* [CMS Collaboration].
 arXiv:1806.10905 [hep-ex]
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73. **“Search for the decay of a Higgs boson in the $\ell\ell\gamma$ channel in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
 A. M. Sirunyan *et al.* [CMS Collaboration].
 arXiv:1806.05996 [hep-ex]
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74. **“Search for supersymmetric partners of electrons and muons in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
 A. M. Sirunyan *et al.* [CMS Collaboration].
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