

# Physics Publications with Major Personal Contributions

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- A. Tumasyan et al., **A portrait of the Higgs boson by the CMS experiment ten years after the discovery**, *Nature*. 607 (2022) 60–68, doi:[10.1038/s41586-022-04892-x](https://doi.org/10.1038/s41586-022-04892-x), arXiv:[2207.00043](https://arxiv.org/abs/2207.00043) [hep-ex]
- A.M. Sirunyan et al., **Search for heavy Higgs bosons decaying to a top quark pair in proton-proton collisions at  $\sqrt{s} = 13$  TeV**, *JHEP*. 04 (2020) 171, doi:[10.1007/JHEP04\(2020\)171](https://doi.org/10.1007/JHEP04(2020)171), arXiv:[1908.01115](https://arxiv.org/abs/1908.01115) [hep-ex]
- A.M. Sirunyan et al., **Observation of the Production of Three Massive Gauge Bosons at  $\sqrt{s} = 13$  TeV**, *Phys. Rev. Lett.* 125 (2020) 151802, doi:[10.1103/PhysRevLett.125.151802](https://doi.org/10.1103/PhysRevLett.125.151802), arXiv:[2006.11191](https://arxiv.org/abs/2006.11191) [hep-ex]
- A.M. Sirunyan et al., **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**, *Eur. Phys. J. C*. 79 (2019) 280, doi:[10.1140/epjc/s10052-019-6730-7](https://doi.org/10.1140/epjc/s10052-019-6730-7), arXiv:[1811.06562](https://arxiv.org/abs/1811.06562) [hep-ex]
- A.M. Sirunyan et al., **Search for the production of  $W^{\pm}W^{\pm}W^{\mp}$  events at  $\sqrt{s} = 13$  TeV**, *Phys. Rev. D*. 100 (2019) 012004, doi:[10.1103/PhysRevD.100.012004](https://doi.org/10.1103/PhysRevD.100.012004), arXiv:[1905.04246](https://arxiv.org/abs/1905.04246) [hep-ex]
- A.M. Sirunyan et al., **Search for new phenomena in final states with two opposite-charge, same-flavor leptons, jets, and missing transverse momentum in pp collisions at  $\sqrt{s} = 13$  TeV**, *JHEP*. 03 (2018) 076, doi:[10.1007/s13130-018-7845-2](https://doi.org/10.1007/s13130-018-7845-2), arXiv:[1709.08908](https://arxiv.org/abs/1709.08908) [hep-ex]
- A.M. Sirunyan et al., **Search for standard model production of four top quarks with same-sign and multilepton final states in protonproton collisions at  $\sqrt{s} = 13$  TeV**, *Eur. Phys. J. C*. 78 (2018) 140, doi:[10.1140/epjc/s10052-018-5607-5](https://doi.org/10.1140/epjc/s10052-018-5607-5), arXiv:[1710.10614](https://arxiv.org/abs/1710.10614) [hep-ex]
- A.M. Sirunyan et al., **Search for dark matter in events with energetic, hadronically decaying top quarks and missing transverse momentum at  $\sqrt{s} = 13$  TeV**, *JHEP*. 06 (2018) 027, doi:[10.1007/JHEP06\(2018\)027](https://doi.org/10.1007/JHEP06(2018)027), arXiv:[1801.08427](https://arxiv.org/abs/1801.08427) [hep-ex]
- A.M. Sirunyan et al., **Combined search for electroweak production of charginos and neutralinos in proton-proton collisions at  $\sqrt{s} = 13$  TeV**, *JHEP*. 03 (2018) 160, doi:[10.1007/JHEP03\(2018\)160](https://doi.org/10.1007/JHEP03(2018)160), arXiv:[1801.03957](https://arxiv.org/abs/1801.03957) [hep-ex]
- A.M. Sirunyan et al., **Searches for pair production of third-generation squarks in  $\sqrt{s} = 13$  TeV pp collisions**, *Eur. Phys. J. C*. 77 (2017) 327, doi:[10.1140/epjc/s10052-017-4853-2](https://doi.org/10.1140/epjc/s10052-017-4853-2), arXiv:[1612.03877](https://arxiv.org/abs/1612.03877) [hep-ex]
- A.M. Sirunyan et al., **Search for top squark pair production in pp collisions at  $\sqrt{s} = 13$  TeV using single lepton events**, *JHEP*. 10 (2017) 019, doi:[10.1007/JHEP10\(2017\)019](https://doi.org/10.1007/JHEP10(2017)019), arXiv:[1706.04402](https://arxiv.org/abs/1706.04402) [hep-ex]
- A.M. Sirunyan et al., **Search for electroweak production of charginos and neutralinos in WH events in proton-proton collisions at  $\sqrt{s} = 13$  TeV**, *JHEP*. 11 (2017) 029, doi:[10.1007/JHEP11\(2017\)029](https://doi.org/10.1007/JHEP11(2017)029), arXiv:[1706.09933](https://arxiv.org/abs/1706.09933) [hep-ex]
- A.M. Sirunyan et al., **Search for new phenomena with the  $M_{T2}$  variable in the all-hadronic final state produced in protonproton collisions at  $\sqrt{s} = 13$  TeV**, *Eur. Phys. J. C*. 77 (2017) 710, doi:[10.1140/epjc/s10052-017-5267-x](https://doi.org/10.1140/epjc/s10052-017-5267-x), arXiv:[1705.04650](https://arxiv.org/abs/1705.04650) [hep-ex]
- A.M. Sirunyan et al., **Search for physics beyond the standard model in events with two leptons of same sign, missing transverse momentum, and jets in protonproton collisions at  $\sqrt{s} = 13$  TeV**, *Eur. Phys. J. C*. 77 (2017) 578, doi:[10.1140/epjc/s10052-017-5079-z](https://doi.org/10.1140/epjc/s10052-017-5079-z), arXiv:[1704.07323](https://arxiv.org/abs/1704.07323) [hep-ex]
- V. Khachatryan et al., **Measurement of the  $W^+W^-$  cross section in pp collisions at  $\sqrt{s} = 8$  TeV and limits on anomalous gauge couplings**, *Eur. Phys. J. C*. 76 (2016) 401, doi:[10.1140/epjc/s10052-016-4219-1](https://doi.org/10.1140/epjc/s10052-016-4219-1), arXiv:[1507.03268](https://arxiv.org/abs/1507.03268) [hep-ex]
- V. Khachatryan et al., **Search for new physics with the  $M_{T2}$  variable in all-jets final states produced in pp collisions at  $\sqrt{s} = 13$  TeV**, *JHEP*. 10 (2016) 006, doi:[10.1007/JHEP10\(2016\)006](https://doi.org/10.1007/JHEP10(2016)006), arXiv:[1603.04053](https://arxiv.org/abs/1603.04053) [hep-ex]

- V. Khachatryan et al., **Search for new physics in final states with two opposite-sign, same-flavor leptons, jets, and missing transverse momentum in pp collisions at  $\sqrt{s} = 13$  TeV**, *JHEP*. 12 (2016) 013, doi:[10.1007/JHEP12\(2016\)013](https://doi.org/10.1007/JHEP12(2016)013), arXiv:[1607.00915](https://arxiv.org/abs/1607.00915) [hep-ex]
- V. Khachatryan et al., **Search for new physics in same-sign dilepton events in protonproton collisions at  $\sqrt{s} = 13$  TeV**, *Eur. Phys. J. C*. 76 (2016) 439, doi:[10.1140/epjc/s10052-016-4261-z](https://doi.org/10.1140/epjc/s10052-016-4261-z), arXiv:[1605.03171](https://arxiv.org/abs/1605.03171) [hep-ex]
- V. Khachatryan et al., **Measurements of  $t$   $\bar{t}$  spin correlations and top quark polarization using dilepton final states in pp collisions at  $\sqrt{s} = 8$  TeV**, *Phys. Rev. D*. 93 (2016) 052007, doi:[10.1103/PhysRevD.93.052007](https://doi.org/10.1103/PhysRevD.93.052007), arXiv:[1601.01107](https://arxiv.org/abs/1601.01107) [hep-ex]
- V. Khachatryan et al., **Measurements of  $t\bar{t}$  charge asymmetry using dilepton final states in pp collisions at  $\sqrt{s} = 8$  TeV**, *Phys. Lett. B*. 760 (2016) 365–386, doi:[10.1016/j.physletb.2016.07.006](https://doi.org/10.1016/j.physletb.2016.07.006), arXiv:[1603.06221](https://arxiv.org/abs/1603.06221) [hep-ex]
- V. Khachatryan et al., **Study of vector boson scattering and search for new physics in events with two same-sign leptons and two jets**, *Phys. Rev. Lett.* 114 (2015) 051801, doi:[10.1103/PhysRevLett.114.051801](https://doi.org/10.1103/PhysRevLett.114.051801), arXiv:[1410.6315](https://arxiv.org/abs/1410.6315) [hep-ex]
- V. Khachatryan et al., **Observation of the rare  $B_s^0 \rightarrow \mu^+ \mu^-$  decay from the combined analysis of CMS and LHCb data**, *Nature*. 522 (2015) 68–72, doi:[10.1038/nature14474](https://doi.org/10.1038/nature14474), arXiv:[1411.4413](https://arxiv.org/abs/1411.4413) [hep-ex]
- V. Khachatryan et al., **Search for Physics Beyond the Standard Model in Events with Two Leptons, Jets, and Missing Transverse Momentum in pp Collisions at  $\sqrt{s} = 8$  TeV**, *JHEP*. 04 (2015) 124, doi:[10.1007/JHEP04\(2015\)124](https://doi.org/10.1007/JHEP04(2015)124), arXiv:[1502.06031](https://arxiv.org/abs/1502.06031) [hep-ex]
- S. Chatrchyan et al., **Measurements of  $t\bar{t}$  Spin Correlations and Top-Quark Polarization Using Dilepton Final States in  $pp$  Collisions at  $\sqrt{s} = 7$  TeV**, *Phys. Rev. Lett.* 112 (2014) 182001, doi:[10.1103/PhysRevLett.112.182001](https://doi.org/10.1103/PhysRevLett.112.182001), arXiv:[1311.3924](https://arxiv.org/abs/1311.3924) [hep-ex]
- S. Chatrchyan et al., **Search for New Physics in Events with Same-Sign Dileptons and Jets in pp Collisions at  $\sqrt{s} = 8$  TeV**, *JHEP*. 01 (2014) 163, doi:[10.1007/JHEP01\(2014\)163](https://doi.org/10.1007/JHEP01(2014)163), arXiv:[1311.6736](https://arxiv.org/abs/1311.6736) [hep-ex]
- S. Chatrchyan et al., **Measurement of Higgs Boson Production and Properties in the WW Decay Channel with Leptonic Final States**, *JHEP*. 01 (2014) 096, doi:[10.1007/JHEP01\(2014\)096](https://doi.org/10.1007/JHEP01(2014)096), arXiv:[1312.1129](https://arxiv.org/abs/1312.1129) [hep-ex]
- V. Khachatryan et al., **Searches for electroweak production of charginos, neutralinos, and sleptons decaying to leptons and W, Z, and Higgs bosons in pp collisions at 8 TeV**, *Eur. Phys. J. C*. 74 (2014) 3036, doi:[10.1140/epjc/s10052-014-3036-7](https://doi.org/10.1140/epjc/s10052-014-3036-7), arXiv:[1405.7570](https://arxiv.org/abs/1405.7570) [hep-ex]
- V. Khachatryan et al., **Measurement of Top Quark-Antiquark Pair Production in Association with a W or Z Boson in pp Collisions at  $\sqrt{s} = 8$  TeV**, *Eur. Phys. J. C*. 74 (2014) 3060, doi:[10.1140/epjc/s10052-014-3060-7](https://doi.org/10.1140/epjc/s10052-014-3060-7), arXiv:[1406.7830](https://arxiv.org/abs/1406.7830) [hep-ex]
- V. Khachatryan et al., **Searches for electroweak neutralino and chargino production in channels with Higgs, Z, and W bosons in pp collisions at 8 TeV**, *Phys. Rev. D*. 90 (2014) 092007, doi:[10.1103/PhysRevD.90.092007](https://doi.org/10.1103/PhysRevD.90.092007), arXiv:[1409.3168](https://arxiv.org/abs/1409.3168) [hep-ex]
- S. Chatrchyan et al., **Measurements of the  $t\bar{t}$  charge asymmetry using the dilepton decay channel in pp collisions at  $\sqrt{s} = 7$  TeV**, *JHEP*. 04 (2014) 191, doi:[10.1007/JHEP04\(2014\)191](https://doi.org/10.1007/JHEP04(2014)191), arXiv:[1402.3803](https://arxiv.org/abs/1402.3803) [hep-ex]
- S. Chatrchyan et al., **Search for New Physics in Events with Same-Sign Dileptons and  $b$  Jets in  $pp$  Collisions at  $\sqrt{s} = 8$  TeV**, *JHEP*. 03 (2013) 037, doi:[10.1007/JHEP03\(2013\)037](https://doi.org/10.1007/JHEP03(2013)037), arXiv:[1212.6194](https://arxiv.org/abs/1212.6194) [hep-ex]
- S. Chatrchyan et al., **Search for New Physics in Events with Opposite-Sign Leptons, Jets, and Missing Transverse Energy in  $pp$  Collisions at  $\sqrt{s} = 7$  TeV**, *Phys. Lett. B*. 718 (2013) 815–840, doi:[10.1016/j.physletb.2012.11.036](https://doi.org/10.1016/j.physletb.2012.11.036), arXiv:[1206.3949](https://arxiv.org/abs/1206.3949) [hep-ex]
- S. Chatrchyan et al., **Measurement of the  $W^+W^-$  Cross Section in  $pp$  Collisions at  $\sqrt{s} = 7$  TeV and Limits on Anomalous  $WW\gamma$  and  $WWZ$  Couplings**, *Eur. Phys. J. C*. 73 (2013) 2610, doi:[10.1140/epjc/s10052-013-2610-8](https://doi.org/10.1140/epjc/s10052-013-2610-8), arXiv:[1306.1126](https://arxiv.org/abs/1306.1126) [hep-ex]
- S. Chatrchyan et al., **Search for Top-Squark Pair Production in the Single-Lepton Final State in pp Collisions at  $\sqrt{s} = 8$  TeV**, *Eur. Phys. J. C*. 73 (2013) 2677, doi:[10.1140/epjc/s10052-013-2677-2](https://doi.org/10.1140/epjc/s10052-013-2677-2), arXiv:[1308.1586](https://arxiv.org/abs/1308.1586) [hep-ex]
- S. Chatrchyan et al., **Measurement of  $W^+W^-$  and  $ZZ$  Production Cross Sections in  $pp$  Collisions at  $\sqrt{s} = 8$  TeV**, *Phys. Lett. B*. 721 (2013) 190–211, doi:[10.1016/j.physletb.2013.03.027](https://doi.org/10.1016/j.physletb.2013.03.027), arXiv:[1301.4698](https://arxiv.org/abs/1301.4698) [hep-ex]
- S. Chatrchyan et al., **Search for heavy, top-like quark pair production in the dilepton final state in  $pp$  collisions at  $\sqrt{s} = 7$  TeV**, *Phys. Lett. B*. 716 (2012) 103–121, doi:[10.1016/j.physletb.2012.07.059](https://doi.org/10.1016/j.physletb.2012.07.059), arXiv:[1203.5410](https://arxiv.org/abs/1203.5410) [hep-ex]

- S. Chatrchyan et al., **Search for new physics with same-sign isolated dilepton events with jets and missing transverse energy**, *Phys. Rev. Lett.* 109 (2012) 071803, doi:[10.1103/PhysRevLett.109.071803](https://doi.org/10.1103/PhysRevLett.109.071803), arXiv:[1205.6615](https://arxiv.org/abs/1205.6615) [hep-ex]
- S. Chatrchyan et al., **Search for new physics in events with same-sign dileptons and  $b$ -tagged jets in  $pp$  collisions at  $\sqrt{s} = 7$  TeV**, *JHEP.* 08 (2012) 110, doi:[10.1007/JHEP08\(2012\)110](https://doi.org/10.1007/JHEP08(2012)110), arXiv:[1205.3933](https://arxiv.org/abs/1205.3933) [hep-ex]
- S. Chatrchyan et al., **Search for electroweak production of charginos and neutralinos using leptonic final states in  $pp$  collisions at  $\sqrt{s} = 7$  TeV**, *JHEP.* 11 (2012) 147, doi:[10.1007/JHEP11\(2012\)147](https://doi.org/10.1007/JHEP11(2012)147), arXiv:[1209.6620](https://arxiv.org/abs/1209.6620) [hep-ex]
- S. Chatrchyan et al., **Search for physics beyond the standard model in events with a  $Z$  boson, jets, and missing transverse energy in  $pp$  collisions at  $\sqrt{s} = 7$  TeV**, *Phys. Lett. B.* 716 (2012) 260–284, doi:[10.1016/j.physletb.2012.08.026](https://doi.org/10.1016/j.physletb.2012.08.026), arXiv:[1204.3774](https://arxiv.org/abs/1204.3774) [hep-ex]
- S. Chatrchyan et al., **Observation of a New Boson at a Mass of 125 GeV with the CMS Experiment at the LHC**, *Phys. Lett. B.* 716 (2012) 30–61, doi:[10.1016/j.physletb.2012.08.021](https://doi.org/10.1016/j.physletb.2012.08.021), arXiv:[1207.7235](https://arxiv.org/abs/1207.7235) [hep-ex]
- S. Chatrchyan et al., **Search for the standard model Higgs boson in the  $H$  to  $ZZ$  to  $2\ell 2\nu$  channel in  $pp$  collisions at  $\sqrt{s} = 7$  TeV**, *JHEP.* 03 (2012) 040, doi:[10.1007/JHEP03\(2012\)040](https://doi.org/10.1007/JHEP03(2012)040), arXiv:[1202.3478](https://arxiv.org/abs/1202.3478) [hep-ex]
- S. Chatrchyan et al., **Search for the standard model Higgs boson decaying to  $W^+W^-$  in the fully leptonic final state in  $pp$  collisions at  $\sqrt{s} = 7$  TeV**, *Phys. Lett. B.* 710 (2012) 91–113, doi:[10.1016/j.physletb.2012.02.076](https://doi.org/10.1016/j.physletb.2012.02.076), arXiv:[1202.1489](https://arxiv.org/abs/1202.1489) [hep-ex]
- V. Khachatryan et al., **First Measurement of the Cross Section for Top-Quark Pair Production in Proton-Proton Collisions at  $\sqrt{s} = 7$  TeV**, *Phys. Lett. B.* 695 (2011) 424–443, doi:[10.1016/j.physletb.2010.11.058](https://doi.org/10.1016/j.physletb.2010.11.058), arXiv:[1010.5994](https://arxiv.org/abs/1010.5994) [hep-ex]
- S. Chatrchyan et al., **Measurement of the  $t\bar{t}$  production cross section and the top quark mass in the dilepton channel in  $pp$  collisions at  $\sqrt{s} = 7$  TeV**, *JHEP.* 07 (2011) 049, doi:[10.1007/JHEP07\(2011\)049](https://doi.org/10.1007/JHEP07(2011)049), arXiv:[1105.5661](https://arxiv.org/abs/1105.5661) [hep-ex]
- S. Chatrchyan et al., **Search for Same-Sign Top-Quark Pair Production at  $\sqrt{s} = 7$  TeV and Limits on Flavour Changing Neutral Currents in the Top Sector**, *JHEP.* 08 (2011) 005, doi:[10.1007/JHEP08\(2011\)005](https://doi.org/10.1007/JHEP08(2011)005), arXiv:[1106.2142](https://arxiv.org/abs/1106.2142) [hep-ex]
- S. Chatrchyan et al., **Search for new physics with same-sign isolated dilepton events with jets and missing transverse energy at the LHC**, *JHEP.* 06 (2011) 077, doi:[10.1007/JHEP06\(2011\)077](https://doi.org/10.1007/JHEP06(2011)077), arXiv:[1104.3168](https://arxiv.org/abs/1104.3168) [hep-ex]
- S. Chatrchyan et al., **Search for Physics Beyond the Standard Model in Opposite-Sign Dilepton Events at  $\sqrt{s} = 7$  TeV**, *JHEP.* 06 (2011) 026, doi:[10.1007/JHEP06\(2011\)026](https://doi.org/10.1007/JHEP06(2011)026), arXiv:[1103.1348](https://arxiv.org/abs/1103.1348) [hep-ex]
- S. Chekanov et al., **Measurement of beauty production from dimuon events at HERA**, *JHEP.* 02 (2009) 032, doi:[10.1088/1126-6708/2009/02/032](https://doi.org/10.1088/1126-6708/2009/02/032), arXiv:[0811.0894](https://arxiv.org/abs/0811.0894) [hep-ex]
- O. Gutsche, **Measurement of Beauty Quark Cross Sections in Photoproduction with the ZEUS Experiment at the Electron Proton Collider HERA**, PhD thesis, Hamburg U., 2005, doi:[10.3204/DESY-THESIS-2005-010](https://doi.org/10.3204/DESY-THESIS-2005-010)
- O. Gutsche, **Development of the trigger algorithm for the MONOLITH experiment**, (2001), DESY report: [DESY-THESIS-2001-020](https://arxiv.org/abs/DESY-THESIS-2001-020)

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