Ilirjan Margjeka

Curriculum Vitae

Rruga e Mimozave, nr. 5
Mamuras 4704
(+355) 67 558 7984

Personal information

Name: **Ilirjan Margjeka**.
Birthday: **20-03-1992**.
Nationality: **Albanian**.
Email: **ilirjan.margjeka@cern.ch**.

Skills

Programing languages: CERN-ROOT, C++, Python
MC tools: MG5, POWHEG-BOX, Pythia8, Delphes, Geant4, Garfield++
Operating Systems: Windows, Linux/Ubuntu

Languages

Albanian — Mother tongue
English — Excellent
German — Excellent
Italian — Excellent

Education

1998–1999 **Elementary School**, *Scuola Elementare Carducci*, Vercelli (Italy).
1999–2003 **Elementary School**, *Scuola Elementare Leone Fontana*, Torino (Italy.
2003–2006 **Middle School**, *Scuola Media Statale Via Donizetti*, Collegno (Italy).
2006–2008 **High School**, *Gesamtschule Winterhude*, Hamburg (Germany).
2008–2011 **High School**, *Gesamtschule Ida Ehre*, Hamburg (Germany).
2012–2015 **Bachelor of Physics**, *University of Tirana*, Tirana (Albania).
(second best student in Physics from 180 students)
2015-2017 **Master of Science in Physics**, *University of Tirana*, Tirana (Albania), (Best student of the Master of Science in Physics in a group out of 12 students and part of the Faculty's Excellence).

⇒ **Master Thesis**, *"Cosmic Rays and Air Shower" (under the supervision of: Prof. Dr. Mimoza Hafizi, UT).*

2018- until now **PhD in Physics**, *Universita' degli Studi "Aldo Moro" di Bari* , Bari (Italy), **"Resonant and non-resonant double Higgs (HH) production in the final state $b\bar{b}ZZ(4l, l = e^{\mp}, \mu^{\mp})$ for RunII data collection at CMS total integrated luminosity of $137.1fb^{-1}$"**.

International Schools

$26^{th}/27^{th}$ September 2016 **The Second International Workshop on recent LHC Physics' results and related topics**, 2016, Tirana, (Albania).

$14^{th} - 20^{th}$ May 2017 **Conference in High Energy Physics and Particle Physics**, $\mathrm{SSHEP}\ 2017$, Sarajevo, (Bosnia and Herzegovina).
Sarajevo School of High Energy Physics 2017

3^{rd} July, 2017–25^{th} August 2017 **Summer Student Program,**, CERN, Geneva, (Switzerland).
"Study of law mass resonances of pp collisions at the LHC: (under the supervision of: **Dr. Mirko Berretti, CERN)**

$10^{th}/12^{th}$ October 2018 **The Third International Workshop on recent LHC Physics' results and related topics**, 2018, Tirana, (Albania).
Presentation hold on: "Double Higgs (H) production at Run2-LHC"

$4^{th}/8^{th}$ Februar 2019 **Particle and Astroparticle Physics School**, 2019, Tirana, (Albania).
Seminars hold for students on: "Tutorials: lab experience with cosmic muons" and "MC tools tutorials"

$16^{th}/20^{th}$ September 2019 **CMS Physics Object School**, 2019, Aachen, (Germany).
Handling reconstructed Physics objects and detector performance quantities in order to support Physics analysis work

$27^{th}/31^{th}$ January 2020 **Particle and Astroparticle Physics School**, 2020, Tirana, (Albania).
Part of organisation committee and seminar hold for students on: "Tutorials: exercises with machine learning tools "

EU Projects

1^{st} January 2020 - Till now — **CREMLIN+**, *EU founded project*, H2020-INFRASUPP-2018-2020.
Connecting Russian and European Measures for Large-scale Research infrastructure (CREMLIN+): "Development and design of Particle Identification and tracking systems" for SCT.

1^{st} January 2020 - Till now — **FEST**, *EU founded project*, H2020-MSCA-RISE-2019.
Future Experiments seek Smart Technologies (FEST)

Research work for the EU projects : "CREMLIN+, FEST"

1^{st} February 2020 - Till now — **CREMLIN+, FEST**, *(EU)*, The MEG-II experiment searches for the lepton-flavor-violating decay:$\mu \longrightarrow e + \gamma$. The reconstruction of the positron trajectory uses a cylindrical drift chamber operated with a mixture of He and iC_4H_{10} gas. It is important to provide a stable performance of the detector in terms of its electron transport parameters, avalanche multiplication, composition and purity of the gas mixture. In order to have a continuous monitoring of the quality of gas, we planed to install a small drift chamber, with a simple geometry that allows to measure very precisely the electron drift velocity in a prompt way. This monitoring chamber will be supplied with gas coming from the inlet and the outlet of the detector to determine if gas contaminations originate inside the main chamber or in the gas supply system. The chamber is a small box with cathode walls, that determine a highly uniform electric field inside two adjacent drift cells. Along the axis separating the two drift cells, four staggered sense wires alternated with five guard wires collect the drifting electrons. The trigger is provided by two ^{90}Sr weak calibration radioactive sources placed on top of a two thin scintillator tiles telescope. The whole system is designed to give a prompt response (within a minute) about drift velocity variations at the 10^{-3} level., "A 10-3 drift velocity monitoring chamber".
`arXiv:2006.05154, jinst:2020JINST15C09007`

Trainings at the CMS experiment (CERN)

8^{th} July - 14^{th} September 2019 — **Stage at CERN**, *RPC group*, The HL-LHC was approved and new goals are set for the RPC system at the CMS experiment. One of those goals is to have an increased rate capability and high efficiency on μ detections ($> 95\%$). I used RPC gaps coverd with coated carbon plates developed at the "Kodel Institue" in South Corea at different impendances (ranging form 50$k\Omega$ to 600$k\Omega$). I implemented new electronics developed at the Univeristy of "Tor Vergata" (Rome, Italy) and designed to match radiations at luminosities up to 3000-5000 fb^{-1} for the HL-LHC. I tested the new prototypes with the new developed Front End electronics board for read-out, achieving efficiencies up to 99% with those plates with the highest impendance of the coated carbon plate (at 600$k\Omega$). , "CMS RPC Background - Studies and Measurements", arXiv:2005.12769.

Research for CMS at CERN

1^{st} July 2018 - Till now

CMS, *(CERN)*, "PAS-PUB", CMS PAS HIG-20-004, Analysis Note: AN-2019/117. Non resonant double Higgs (HH) production in the final state $b\bar{b}ZZ(4l, l = e^{\mp}, \mu^{\mp})$ for RunII data collection: I analyzed experimental data corresponding to an integrated luminosity of 137 fb^{-1} of proton-proton collision at $\sqrt{s} = 13$ TeV collected with the CMS detector during the years 2016 to 2018. I was able to set an upper limit of 30 at 95% confidence level is set on the signal strength modifier μ, defined as the ratio of the observed double-Higgs boson rate in the $ggF - HH \rightarrow b\bar{b}4l$ decay channel to the standard model (SM) expectation. Since the double Higgs (HH) is a SM theretically redicted Physics event, as a result from the Higgs otential, I was able to genearate a scan on the SM Higgs trilinear coupling (the so called k_{λ}-scan) form values ranging from -15 up to $+15$. As a result, the SM Higgs trilinear coupling was constrained to be within the range $-9 \prec k_{\lambda_{HHH}} \prec 14$ at 95% (CL). In the beginning of this analysis, I did several theoretical studies for the NLO ggF model with full top quark mass dependecy. I compared the model with two different MC generator: `POWHEG-BOX-V2` and `MadGraph5_aMC@NLO` and then I calculated the theoretical uncertainties for the production, implemented in the analysis.

1^{st} July 2020 - Till now

CMS, *(CERN)*, Analysis Note: AN-2021/115. Resonant double Higgs (HH) in the final state $b\bar{b}ZZ(4l, l = e^{\mp}, \mu^{\mp})$ for RunII data collection: The resonant studies of the double Higgs boson production is involved in BSM theories, like: NMSSM, 2HDM, Extra Warped Dimensions (Bulk Graviton Spin-2 and Radion Spin-0), where Bulk Graviton Spin-2 and Radion Spin-0 as a result form warped extra dimensions from the Kaluza-Klein theory are our main topics of interst. I am analyzing data corresponding to an integrated luminosity of 137 fb^{-1} of proton-proton collision at $\sqrt{s} = 13$ TeV collected with the CMS detector during the years 2016 to 2018. The goal is to investigate the possible invariant masses of the Bulk Graviton Spin-2 and Radion Spin-0, in order to set a possible a 95% confidence level on the signal strength modifier μ, defined as the ratio of the observed double-Higgs boson rate in the $ggF - HH \rightarrow b\bar{b}4l$ decay channel to the standard model (SM) expectation. I will perfom the study generating seeral mass points, allowing us to do a mass scan starting from 260 GeV up to several TeV ($\sim 2TeV$) and at the moment we are speaking, we can exclude $M_{inv}^{RD,BK} < 500GeV$ at 95% (CL).

Publications

CMS collaboration

CMS, *(CERN)*, "Double Higgs boson search in the 4-lepton plus 2b jets final states at s $\sqrt{s} = 13$ TeV with full Run II data", `CMS PAS HIG-20-004`.

RPC group

CMS, *(CERN)*, "CMS RPC Background - Studies and Measurements", `arXiv:2005.12769`.

CREMLIN+

MEG-II Eperiment, "A 10-3 drift velocity monitoring chamber", `arXiv:2006.05154`, `jinst:2020JINST15C09007`.

CMS published articles

CMS, *(CERN)*, "Search for resonant pair production of Higgs bosons in the bbZZ channel in proton-proton collisions at $\sqrt{s} = 13$ TeV", `arXiv:2006.06391; CMS-HIG-18-013; CERN-EP-2020-079; CMS-HIG-18-013-003`.

CMS published articles

CMS, *(CERN)*, I. Margjeka *et al.* , "Search for electroweak production of charginos and neutralinos in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2106.14246 "[hep-ex]]. .

CMS published articles

CMS, *(CERN)*, I. Margjeka *et al.* , "Fragmentation of jets containing a prompt J/ψ meson in PbPb and pp collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV" [arXiv:2106.13235 "[hep-ex]]. .

CMS published articles **CMS**, *I. Margjeka et al. , "Measurement of the electroweak production of Zγ and two jets in proton-proton collisions at $\sqrt{s}$ = 13 TeV and constraints on anomalous quartic gauge couplings" [arXiv:2106.11082 "[hep-ex]].* .

CMS published articles **CMS**, *I. Margjeka et al. , "Search for Wγ resonances in proton-proton collisions at $\sqrt{s}$ = 13 TeV using hadronic decays of Lorentz-boosted W bosons" [arXiv:2106.10509 "[hep-ex]].* .

CMS published articles **CMS**, *I. Margjeka et al. , "Search for a heavy Higgs boson decaying into two lighter Higgs bosons in the $\tau\tau$bb final state at 13 TeV" [arXiv:2106.10361 "[hep-ex]].* .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of Z bosons plus jets using variables sensitive to double parton scattering in pp collisions at 13 TeV" [arXiv:2105.14511 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of the pp $\rightarrow$ W$^{\pm}\gamma\gamma$ and pp $\rightarrow$ Z$\gamma\gamma$ cross sections at $\sqrt{s}$ = 13 TeV and limits on anomalous quartic gauge couplings" [arXiv:2105.12780 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for strongly interacting massive particles generating trackless jets in proton-proton collisions at $\sqrt{s}$ = 13 TeV" [arXiv:2105.09178 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "CMS phase-II upgrade of the RPC Link System" JINST **16** (2021) no.05, C05003 DOI:10.1088/1748-0221/16/05/C05003 .

CMS published articles **CMS**, *(CERN)*, CMS:2021rsq I. Margjeka *et al.* , "Search for lepton-flavor violating decays of the Higgs boson in the $\mu\tau$ and eτ final states in proton-proton collisions at $\sqrt{s}$ = 13 TeV" [arXiv:2105.03007 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka*et al.* , "Front-end electronics for CMS iRPC detectors" JINST **16** (2021) no.05, C05002 DOI:10.1088/1748-0221/16/05/C05002.

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for long-lived particles decaying to jets with displaced vertices in proton-proton collisions at $\sqrt{s}$ = 13 TeV" [arXiv:2104.13474 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for a heavy resonance decaying to a top quark and a W boson at $\sqrt{s}$ = 13 TeV in the fully hadronic final state" [arXiv:2104.12853 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Constraints on anomalous Higgs boson couplings to vector bosons and fermions in its production and decay using the four-lepton final state" [arXiv:2104.12152 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Research and development of the back-end electronics for the two-dimensional improved resistive plate chambers in CMS upgrade" Rad. Det. Tech. Meth. **5** (2021) no.2, 181-191 DOI:10.1007/s41605-020-00229-2.

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for W' bosons decaying to a top and a bottom quark at $\sqrt{s}$ =13 TeV in the hadronic final state" [arXiv:2104.04831 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for charged Higgs bosons produced in vector boson fusion processes and decaying into vector boson pairs in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2104.04762 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Precision luminosity measurement in proton-proton collisions at $\sqrt{s} = 13$ TeV in 2015 and 2016 at CMS" [arXiv:2104.01927 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "High precision measurements of Z boson production in PbPb collisions at $\sqrt{s_{\mathrm{NN}}} = 5.02$ TeV" [arXiv:2103.14089 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of Higgs boson production cross sections and couplings in the diphoton decay channel at $\sqrt{s} = 13$ TeV" [arXiv:2103.06956 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of production cross sections of the Higgs boson in the four-lepton final state in proton–proton collisions at $\sqrt{s} = 13$ TeV ", Eur. Phys. J. C **81** (2021) no.6, 488, DOI:10.1140/epjc/s10052-021-09200-x, [arXiv:2103.04956 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Using Z boson events to study parton-medium interactions in PbPb collisions" [arXiv:2103.04377 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for resonant and nonresonant new phenomena in high-mass dilepton final states at $\sqrt{s} = 13$ TeV" [arXiv:2103.02708 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for top squark production in fully-hadronic final states in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2103.01290 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Study of Drell-Yan dimuon production in proton-lead collisions at $\sqrt{s_{\mathrm{NN}}} = 8.16$ TeV" JHEP **05** (2021), 182 DOI:10.1007/JHEP05(2021)182 [arXiv:2102.13648 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of angular distance and momentum ratio distributions in three-jet and Z + two-jet final states in pp collisions" [arXiv:2102.08816 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for a heavy vector resonance decaying to a Z boson and a Higgs boson in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2102.08198 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* [TOTEM and CMS], "Hard color-singlet exchange in dijet events in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2102.06945 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for top squarks in final states with two top quarks and several light-flavor jets in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2102.06976 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Performance of the CMS muon trigger system in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2102.04790 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Observation of a New Excited Beauty Strange Baryon Decaying to$\Xi_b^- \pi^+ \pi^-$" Phys. Rev. Lett. **126** (2021) no.25, 252003 DOI:10.1103/PhysRevLett.126.252003 [arXiv:2102.04524 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of the differential cross sections of the production of Z + jets and γ + jets and of Z boson emission collinear with a jet in pp collisions at $\sqrt{s}$ = 13 TeV" JHEP **05** (2021), 285 DOI:10.1007/JHEP05(2021)285 [arXiv:2102.02238 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of the Wγ Production Cross Section in Proton-Proton Collisions at $\sqrt{s}$=13 TeV and Constraints on Effective Field Theory Coefficients" Phys. Rev. Lett. **126** (2021) no.25, 252002 DOI:10.1103/PhysRevLett.126.252002 [arXiv:2102.02283 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "In-medium modification of dijets in PbPb collisions at $\sqrt{s_{\mathrm{NN}}}$ = 5.02 TeV" JHEP **05** (2021), 116 DOI:10.1007/JHEP05(2021)116 [arXiv:2101.04720 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of the Z boson differential production cross section using its invisible decay mode (Z$\nu\bar{\nu}$) in proton-proton collisions at $\sqrt{s}$ = 13 TeV" JHEP **05** (2021), 205 DOI:10.1007/JHEP05(2021)205 [arXiv:2012.09254 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "First measurement of the cross section for top quark pair production with additional charm jets using dileptonic final states in pp collisions at $\sqrt{s}$ = 13 TeV" [arXiv:2012.09225 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for supersymmetry in final states with two oppositely charged same-flavor leptons and missing transverse momentum in proton-proton collisions at $\sqrt{s}$ = 13 TeV" JHEP **04** (2021), 123 DOI:10.1007/JHEP04(2021)123 [arXiv:2012.08600 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Electron and photon reconstruction and identification with the CMS experiment at the CERN LHC" JINST **16** (2021) no.05, P05014 DOI:10.1088/1748-0221/16/05/P05014 [arXiv:2012.06888 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for singly and pair-produced leptoquarks coupling to third-generation fermions in proton-proton collisions at $\sqrt{s}$ = 13 TeV" Phys. Lett. B **819** (2021), 136446 DOI:10.1016/j.physletb.2021.136446 [arXiv:2012.04178 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for new physics in top quark production with additional leptons in proton-proton collisions at $\sqrt{s}$ = 13 TeV using effective field theory" JHEP **03** (2021), 095 DOI:10.1007/JHEP03(2021)095 [arXiv:2012.04120 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of differential cross sections for Z bosons produced in association with charm jets in pp collisions at $\sqrt{s}$ = 13 TeV" JHEP **04** (2021), 109 DOI:10.1007/JHEP04(2021)109 [arXiv:2012.04119 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for long-lived particles using displaced jets in proton-proton collisions at $\sqrt{s}$ = 13 TeV" [arXiv:2012.01581 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for nonresonant Higgs boson pair production in final states with two bottom quarks and two photons in proton-proton collisions at $\sqrt{s} = 13$ TeV" JHEP **03** (2021), 257 DOI:10.1007/JHEP03(2021)257 [arXiv:2011.12373 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for the rare decay of the W boson into a pion and a photon in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Lett. B **819** (2021), 136409 DOI:10.1016/j.physletb.2021.136409 [arXiv:2011.06028 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Observation of forward neutron multiplicity dependence of dimuon acoplanarity in ultraperipheral PbPb collisions at $\sqrt{s_{\mathrm{NN}}} = 5.02$ TeV" [arXiv:2011.05239 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of the Higgs boson production rate in association with top quarks in final states with electrons, muons, and hadronically decaying tau leptons at $\sqrt{s} = 13$ TeV" Eur. Phys. J. C **81** (2021) no.4, 378 DOI:10.1140/epjc/s10052-021-09014-x [arXiv:2011.03652 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Development and validation of HERWIG 7 tunes from CMS underlying-event measurements" Eur. Phys. J. C **81** (2021) no.4, 312 DOI:10.1140/epjc/s10052-021-08949-5 [arXiv:2011.03422 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "The very forward CASTOR calorimeter of the CMS experiment" JINST **16** (2021) no.02, P02010 DOI:10.1088/1748-0221/16/02/P02010 [arXiv:2011.01185 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Angular analysis of the decay $\mathrm{B}^+ \to \mathrm{K}^*(892)^+\mu^+\mu^-$ in proton-proton collisions at $\sqrt{s} = 8$ TeV" JHEP **04** (2021), 124 DOI:10.1007/JHEP04(2021)124 [arXiv:2010.13968 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* "A new approach for CMS RPC current monitoring using Machine Learning techniques" JINST **15** (2020) no.10, C10009 DOI:10.1088/1748-0221/15/10/C10009.

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* "RPC system in the CMS Level-1 Muon Trigger" JINST **15** (2020) no.10, C10007 DOI:10.1088/1748-0221/15/10/C10007.

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "MUSiC: a model unspecific search for new physics in proton-proton collisions at $\sqrt{s} = 13$ TeV" [arXiv:2010.02984 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for dark photons in Higgs boson production via vector boson fusion in proton-proton collisions at $\sqrt{s} = 13$ TeV" JHEP **03** (2021), 011 DOI:10.1007/JHEP03(2021)011 [arXiv:2009.14009 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of prompt D^0 and $\overline{\mathrm{D}}^0$ meson azimuthal anisotropy and search for strong electric fields in PbPb collisions at $\sqrt{s_{\mathrm{NN}}} = 5.02$ TeV" Phys. Lett. B **816** (2021), 136253 DOI:10.1016/j.physletb.2021.136253 [arXiv:2009.12628 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of production cross sections of polarized same-sign W boson pairs in association with two jets in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Lett. B **812** (2021), 136018 DOI:10.1016/j.physletb.2020.136018 [arXiv:2009.09429 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of the top quark Yukawa coupling from $\mathrm{t\bar{t}}$ kinematic distributions in the dilepton final state in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Rev. D **102** (2020) no.9, 092013 DOI:10.1103/PhysRevD.102.092013 [arXiv:2009.07123 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Evidence for Higgs boson decay to a pair of muons" JHEP **01** (2021), 148 DOI:10.1007/JHEP01(2021)148 [arXiv:2009.04363 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of $\mathrm{pp} \to \mathrm{ZZ}$ production cross sections and constraints on anomalous triple gauge couplings at $\sqrt{s} = 13$TeV " Eur. Phys. J. C **81** (2021) no.3, 200 DOI:10.1140/epjc/s10052-020-08817-8 [arXiv:2009.01186 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "$\mathrm{W^+W^-}$ boson pair production in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Rev. D **102** (2020) no.9, 092001 DOI:10.1103/PhysRevD.102.092001 [arXiv:2009.00119 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Observation of electroweak production of $\mathrm{W}\gamma$ with two jets in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Lett. B **811** (2020), 135988 DOI:10.1016/j.physletb.2020.135988 [arXiv:2008.10521 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "A search for bottom-type, vector-like quark pair production in a fully hadronic final state in proton-proton collisions at $\sqrt{s} =$ 13 TeV" Phys. Rev. D **102** (2020), 112004 DOI:10.1103/PhysRevD.102.112004 [arXiv:2008.09835 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of $\mathrm{B_c(2S)^+}$ and $\mathrm{B_c^*(2S)^+}$ cross section ratios in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Rev. D **102** (2020) no.9, 092007 DOI:10.1103/PhysRevD.102.092007 [arXiv:2008.08629 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of differential $\mathrm{t\bar{t}}$ production cross sections using top quarks at large transverse momenta in pp collisions at $\sqrt{s} = 13$ TeV" Phys. Rev. D **103** (2021) no.5, 052008 DOI:10.1103/PhysRevD.103.052008 [arXiv:2008.07860 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Evidence for electroweak production of four charged leptons and two jets in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Lett. B **812** (2021), 135992 DOI:10.1016/j.physletb.2020.135992 [arXiv:2008.07013 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for top squark pair production using dilepton final states in pp collision data collected at $\sqrt{s} = 13$ TeV" Eur. Phys. J. C **81** (2021) no.1, 3 DOI:10.1140/epjc/s10052-020-08701-5 [arXiv:2008.05936 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for dark matter produced in association with a leptonically decaying Z boson in proton-proton collisions at $\sqrt{s} = 13$ TeV" Eur. Phys. J. C **81** (2021) no.1, 13 [erratum: Eur. Phys. J. C **81** (2021) no.4, 333] DOI:10.1140/epjc/s10052-020-08739-5 [arXiv:2008.04735 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for supersymmetry in proton-proton collisions at $\sqrt{s} = 13$ TeV in events with high-momentum Z bosons and missing transverse momentum" JHEP **09** (2020), 149 DOI:10.1007/JHEP09(2020)149 [arXiv:2008.04422 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of the W boson rapidity, helicity, double-differential cross sections, and charge asymmetry in pp collisions at $\sqrt{s} = 13$ TeV" Phys. Rev. D **102** (2020) no.9, 092012 DOI:10.1103/PhysRevD.102.092012 [arXiv:2008.04174 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for the lepton flavor violating decay $\tau \to 3\mu$ in proton-proton collisions at $\sqrt{s} = 13$ TeV" JHEP **01** (2021), 163 DOI:10.1007/JHEP01(2021)163 [arXiv:2007.05658 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for decays of the 125 GeV Higgs boson into a Z boson and a ρ or ϕ meson" JHEP **11** (2020), 039 DOI:10.1007/JHEP11(2020)039 [arXiv:2007.05122 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurement of the CP-violating phase ϕ_{s} in the $\mathrm{B}^0_{\mathrm{s}} \to \mathrm{J}/\psi\,\phi(1020) \to \mu^+\mu^-\mathrm{K}^+\mathrm{K}^-$ channel in proton-proton collisions at $\sqrt{s} =$ 13 TeV" Phys. Lett. B **816** (2021), 136188 DOI:10.1016/j.physletb.2021.136188 [arXiv:2007.02434 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Reconstruction of signal amplitudes in the CMS electromagnetic calorimeter in the presence of overlapping proton-proton interactions" JINST **15** (2020) no.10, P10002 DOI:10.1088/1748-0221/15/10/P10002 [arXiv:2006.14359 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Inclusive search for highly boosted Higgs bosons decaying to bottom quark-antiquark pairs in proton-proton collisions at $\sqrt{s} =$ 13 TeV" JHEP **12** (2020), 085 DOI:10.1007/JHEP12(2020)085 [arXiv:2006.13251 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Observation of the Production of Three Massive Gauge Bosons at $\sqrt{s} =$13 TeV" Phys. Rev. Lett. **125** (2020) no.15, 151802 DOI:10.1103/PhysRevLett.125.151802 [arXiv:2006.11191 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Evidence for Top Quark Production in Nucleus-Nucleus Collisions" Phys. Rev. Lett. **125** (2020) no.22, 222001 DOI:10.1103/PhysRevLett.125.222001 [arXiv:2006.11110 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for resonant pair production of Higgs bosons in the $bbZZ$ channel in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Rev. D **102** (2020) no.3, 032003 DOI:10.1103/PhysRevD.102.032003 [arXiv:2006.06391 "[hep-ex]]. .

MEG experiment **MEG**, *(Cremlin+, EU)*, I. Margjeka *et al.* "A 10^{-3} drift velocity monitoring chamber" JINST **15** (2020) no.09, C09007 DOI:10.1088/1748-0221/15/09/C09007 [arXiv:2006.05154 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Towards a two-dimensional readout of the improved CMS Resistive Plate Chamber with a new front-end electronics" JINST **16** (2021) no.04, C04001 DOI:10.1088/1748-0221/16/04/C04001 [arXiv:2006.00576 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "CMS RPC activities during LHC LS-2" JINST **15** (2020) no.10, C10025 DOI:10.1088/1748-0221/15/10/C10025 [arXiv:2005.12534 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Experiences from the RPC data taking during the CMS RUN-2" JINST **15** (2020) no.10, C10027 DOI:10.1088/1748-0221/15/10/C10027 [arXiv:2005.12532 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "CMS RPC background — studies and measurements" JINST **16** (2021) no.04, C04005 DOI:10.1088/1748-0221/16/04/C04005 [arXiv:2005.12769 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Improved-RPC for the CMS muon system upgrade for the HL-LHC" JINST **15** (2020) no.11, C11012 DOI:10.1088/1748-0221/15/11/C11012 [arXiv:2005.11396 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* [CMS Muon Group], "Aging Study on Resistive Plate Chambers of the CMS Muon Detector for HL-LHC" JINST **15** (2020) no.11, C11002 DOI:10.1088/1748-0221/15/11/C11002 [arXiv:2005.11397 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Effects of the electronic threshold on the performance of the RPC system of the CMS experiment" JINST **15** (2020) no.09, C09025 DOI:10.1088/1748-0221/15/09/C09025 [arXiv:2005.09472 [physics.ins-det]]..

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for a light pseudoscalar Higgs boson in the boosted $\mu\mu\tau\tau$ final state in proton-proton collisions at $\sqrt{s} = 13$ TeV" JHEP **08** (2020), 139 DOI:10.1007/JHEP08(2020)139 [arXiv:2005.08694 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for a light charged Higgs boson in the $H^{\pm} \to cs$ channel in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Rev. D **102** (2020) no.7, 072001 DOI:10.1103/PhysRevD.102.072001 [arXiv:2005.08900 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Observation of the $B_s^0 \to X(3872)\phi$ decay" Phys. Rev. Lett. **125** (2020) no.15, 152001 DOI:10.1103/PhysRevLett.125.152001 [arXiv:2005.04764 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Measurements of production cross sections of WZ and same-sign WW boson pairs in association with two jets in proton-proton collisions at $\sqrt{s} = 13$ TeV" Phys. Lett. B **809** (2020), 135710 DOI:10.1016/j.physletb.2020.135710 [arXiv:2005.01173 "[hep-ex]]. .

CMS published articles **CMS**, *(CERN)*, I. Margjeka *et al.* , "Search for disappearing tracks in proton-proton collisions at $\sqrt{s} = 13$ TeV", Phys. Lett. B **806** (2020), 135502 , DOI:10.1016/j.physletb.2020.135502, [arXiv:2004.05153 "[hep-ex]]. .