

Rebeca Gonzalez Suarez

rebeca@cern.ch, gs.rebeca@gmail.com

Current Position

Adjunct Research Associate at the University of Nebraska, Lincoln, US. Member of the CMS collaboration since 2006. Researcher stationed at CERN in Geneva (Switzerland) since 2008.

Previous Positions

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| 2010 | Post-doctoral fellow (<i>November - October 2012</i>) at the Vrije Universiteit Brussel (VUB), Brussels (Belgium) |
| 2006 | PhD Student with an FPI grant (<i>September - October 2010</i>) at Instituto de Fisica de Cantabria (IFCA), Santander (Spain) |

Academic Degrees

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| 2010 | Ph.D at the Department of Modern Physics of the University of Cantabria, Santander (Spain) |
| 2005 | Degree in Fundamental Physics at the Universidad de Oviedo, Facultad de Ciencias. Oviedo, Spain |

Dissertations and Thesis

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| 2010 | Ph.D thesis (<i>9 Sep.</i>)
Title: ‘ <i>Search for a SM Higgs Boson in the LHC with the CMS experiment using the $H \rightarrow WW^* \rightarrow 2\mu 2\nu$ decay channel</i> ’
Supervisors: J. Cuevas and T. Anoro. |
| 2007 | Diploma de Estudios Avanzados (<i>21 Dec.</i>)
Title: ‘ <i>Search for a Higgs boson in CMS in the $H \rightarrow WW^* \rightarrow 2\mu 2\nu$ decay channel</i> ’
Supervisors: J. Cuevas and T. Anoro. |

Positions of Responsibility

- **Single Top convener:** (2013-2014) Coordinator of single-top-quark related physics in the CMS experiment. Level 3 management within the CMS collaboration
- **Editor of the publications** arXiv:1411.3441 (PRD), and arXiv:1209.3489 (PRL)
- **Editor and contact person** for the analysis of other public documents (TOP-11-022, HIG-14-012)
- **Contact person** person for the simulation in the Higgs to WW subgroup (2014-2015)
- **Contact person** and developer of the local reconstruction of the CMS Silicon Strip Tracker (2011-2012)
- **Contact person** for the High Level Trigger - Strip Tracker (2011-2012)
- **Run Field Manager:** (2015) coordinating during two weeks the operations of the CMS experiment, operating as the link between the shift crews and Run coordination

Member of the Analysis Review Committee (ARC)

- 2015 – **Chair** ‘Measurement of the W boson helicity using $t\bar{t}$ events in the dilepton final state at $\sqrt{s} = 8$ TeV’ CMS-PAS-TOP-14-017
- ‘Search for a standard model Higgs boson produced in association with a top-quark pair and decaying to bottom quarks using a matrix element method’ arXiv:1502.02485 Eur. Phys. J. C 75 (2015) 251
- **Chair** ‘Search for monotop signatures in proton-proton collisions at $\sqrt{s} = 8$ TeV’ arXiv:1410.1149 Phys. Rev. Lett. 114, 101801 (2015)
- 2014 – ‘Search for $t\bar{t}H$ events in the $H \rightarrow b\bar{b}$ final state using the Matrix Element Method’ (CMS-PAS-HIG-14-010)
- ‘Searches for electroweak production of charginos, neutralinos, and sleptons decaying to leptons and W, Z, and Higgs bosons in pp collisions at 8 TeV’ arXiv:1405.7570, EPJC 74 (2014) 3036
- **Chair** ‘Search for new physics with monotop final states in pp collisions at $\sqrt{s} = 8$ TeV’ (CMS-PAS- B2G-12-022)
- ‘Search for associated production of a single top quark and a Higgs boson in events where the Higgs boson decays to two photons at $\sqrt{s} = 8$ TeV’ (CMS-PAS-HIG-14-001)
- 2013 – ‘Projections for Top FCNC Searches in $3000fb^{-1}$ at the LHC’ (CMS-PAS-FTR-13-016)
- ‘Sensitivity study of the prospects for searching for heavy vector-like charge 2/3 quarks at $\sqrt{s} = 14$ TeV with the upgraded CMS detector’ (CMS-PAS-FTR-13-026)
- ‘Projected improvement of the accuracy of top-quark mass measurements at the upgraded LHC’ (CMS-PAS-FTR-13-017)
- ‘CMS reach in $B_s^0 \rightarrow \mu^+\mu^-$ and $B^0 \rightarrow \mu^+\mu^-$ branching fractions for the new LHC runs’ (CMS-PAS-FTR-13-022)
- ‘Search for electroweak production of charginos and neutralinos using leptonic final states’ (CMS-PAS-SUS-13-006)
- ‘Search for electroweak production of charginos, neutralinos and sleptons using leptonic final states in pp collisions at $\sqrt{s} = 8$ TeV’ (CMS-PAS-SUS-12-022)
- 2012 – ‘Search for electroweak production of charginos and neutralinos using leptonic final states in pp collisions at $\sqrt{s} = 7$ TeV’ arXiv:1209.6620, JHEP 1211 (2012) 147
- ‘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’ arXiv:1204.3774, Physics Letters B 716 (2012) 260-284
- 2011 – ‘Search for Physics Beyond the Standard Model in Z+MET+Jets events at the LHC’ (CMS-PAS-SUS-11-019)

Participation in Conferences and Seminars

- 2015
- ▷ **Seminar at the University of Nebraska, Lincoln**
Title: *‘Higgs boson decays to WW at CMS’*
10 August, University of Nebraska, Lincoln NE (United States)
 - ▷ **DPF2015: 2015 Meeting of the Division of Particles and Fields of the American Physical Society**
Contribution: Parallel Talk
Title: *‘Run-1 Single-top measurements at CMS’*
4-8 Aug, University of Michigan, Ann Arbor, MI (United States)
 - ▷ **Seminar at University of Goettingen, II. Physikalisches Institut**
Title: *‘Overview of single top physics in CMS with Run-1 data’*
19th June, Goettingen (Germany)
 - ▷ **SM@LHC: Standard Model at LHC**
Contribution: **Plenary Talk**
Title: *‘LHC results on Spin, Anomalous Couplings, and CP structure’*
21-24 April, Galileo Galilei Institute, Florence (Italy)
 - ▷ **Seminar at the Universite Catholique de Louvain**
Title: *‘Is it the Higgs? Characterization of the $H(125)$ resonance (spin, parity, tensor structure) with leptonic WW decays’*
18th March, Louvain la Neuve (Belgium)
 - ▷ **Seminar at the EPFL Lausanne**
Title: *‘Overview of single top physics in CMS with Run-1 data’*
2d of March, Lausanne (Switzerland)
- 2014
- ▷ **Second CMS Single Top Workshop**
Contribution: **Scientific Program and Talk**
Title: *‘Lessons learned from Run1 and future prospects’*
4-5 December, Palazzo Alabardieri, Naples (Italy)
 - ▷ **Collider Cross Talk**
Title: *‘ $H \rightarrow WW$ from ATLAS and CMS’*
27 November, CERN (Switzerland)
 - ▷ **LHCP 2014 - The Second Large Hadron Collider Physics conference**
Contribution: **Chair of the TOP Parallel sessions**
2-7 June, New York City (United States)
 - ▷ **LHC seminar**
Title: *‘Recent top physics results from CMS’*
25 February, CERN (Switzerland)
- 2013
- ▷ **CMS Single Top Workshop**
Contribution: **Scientific Program and Closing Talk**
Title: *‘Next steps and summary’*
19-20 December, Palazzo Alabardieri, Naples (Italy)
 - ▷ **Seminar at Uppsala University**
Title: *‘Overview of single top results at the LHC’*
10 October, Uppsala (Sweden)
 - ▷ **TOP2013 - 6th International Workshop on Top Quark Physics**
Contribution: **Plenary Talk**
Title: *‘Inclusive single top cross section at the LHC’*
4-19 September, Durbach (Germany)

- 2012 ▷ **4th generation and single-top: Workshop on fourth fermion generation and on single-top production**
 Contribution: **Invited Talk**
 Title: *'tW production at CMS'*
 26-28 March, Leinsweiler (Germany)
- ▷ **Rencontres de Moriond, QCD and High Energy Interactions**
 Contribution: **Plenary Talk**
 Title: *'Single Top Production at $\sqrt{s} = 7\text{TeV}$ '*
 10-17 March, La Thuile (Italy)
- 2010 ▷ **II CPAN days**, Segundas Jornadas del CPAN
 Contribution: **Invited Plenary Talk**
 Title: *'Higgs and SUSY searches in CMS'*
 29-30 November, Valencia (Spain)
- ▷ **BEACH 2010** IX International Conference on Hyperons, Charm and Beauty Hadrons
 Contribution: **Plenary Talk**
 Title: *'Higgs Search Prospects at the LHC'*
Chair of the session 'Heavy Flavor Decays and Properties - I'
 21-26 June, Perugia (Italy)
- 2009 ▷ **PASCOS 2009** 15th International Symposium on Particles Strings and Cosmology
 Contribution: **Parallel Talk**
 Title: *'EW symmetry breaking at the LHC'*
 6-10 July, Hamburg (Germany)
- 2008 ▷ **ICHEP08** 34th International Conference on High Energy Physics
 Contribution: **Poster**
 Title: *'Discovery Potential for the SM Higgs Boson in the $H \rightarrow WW^* \rightarrow 2l2\nu$ channel at LHC'*
 July 29 - August 5, Philadelphia, Pennsylvania (United States)
- 2007 ▷ **CHEP'07** International Conference on Computing in High Energy and Nuclear Physics
 Contribution: **Poster** (co-author)
 Title: *'A software and computing prototype for CMS Muon system alignment'*
 2-7 September, Victoria BC (Canada)

Other Conferences/Workshop/Schools

- 2011 | ▷ **TOP2011, 4th International Workshop on Top Quark Physics**
25 - 30 September, Sant Feliu de Guixols (Spain)
- ▷ **CMS Physics Week**
11-15 September, Brussels (Belgium)
Co-chair of the poster session
- ▷ **Rencontres de Moriond, QCD and High Energy Interactions**
20-27 March, La Thuile (Italy)
- 2009 | ▷ **Frontier Physics at the LHC - CMS Physics Week**
7-11 September, Bologna, (Italy)
- ▷ **Fourth joint CERN-Fermilab Hadron Collider Physics Summer School**
June 8-17 2009, at CERN, Geneva (Switzerland)
- ▷ **XXXVII International Meeting on Fundamental Physics**
8-13 February, Centro de Ciencias Pedro Pascual, Benasque (Spain)
- 2007 | ▷ **Grupos de Trabajo de las Jornadas Tecnicas RedIRIS 2007**
19 and 20 November, Universidad de Oviedo, Campus de Mieres (Spain)
- 2006 | ▷ **TAE 2006 V Taller de Altas Energias**
3-14 July, (IFCA), Santander (Spain)
- ▷ **Meeting of the Interactive European Grid Project**
int.eu.grid Kick-off Meeting, 19-23 de June, Santander (Spain)

Board participation

- 2015 | **PhD thesis committee member**
(20th March) at Uppsala University (Sweden)
Thesis Title: '*Search for a Charged Higgs Boson in ATLAS and Development of Novel Technology for Future Particle Detector Systems*'
by **Daniel Pelikan**
- 2013 | **Master thesis promotor**
(24 June) at the Vrije Universiteit Brussel (Belgium)
Thesis Title: '*Measurement of the single top tW associated production in the dilepton decay channel in proton proton collisions at a center of mass energy of 8 TeV*'
by **Isis Marina Van Parijs**

Outreach Activities

- **Official CERN guide** since 2011, and **Official CMS guide** with more than 100 visits underground, including virtual visits to international audiences
- **CERN contact** of the Expanding your horizons (EYH) conference in Geneva, 14th November 2015, and 16th November 2013. Organizer of the 4 CERN workshops. **Workshop leader** of the 'Questions without answers at the LHC' session in the EYH event in 2011
- **Moderator** of the International Masterclasses by the International Particle Physics Outreach Group (IPPOG) (2015)
- 'Ask a scientist' activity in the night of the Researchers in the FNAC in Geneva (2014)
- Speaking role in the videos advertising the role of the US in the CMS Experiment [link] (2014)
- 'Particle Fever' movie meet and greet in the University of Columbia (NY) (2014)
- Role in the official CERN LHC Season 2 videos [link] (2015)
- Guest speaker at ENP Ferney for gender awareness training (2012)

- Contributions to the CMS blog ‘the Cylindrical Onion’ and to the IPPOG website
- Personal blog with CERN pictures, ‘lonelychairsatcern.tumblr.com’ (20K followers)

Other Activities

- Experienced shifter: Offline Drift Tube muon chambers (DT) (2008), DT online (2009), DT on-call (2010), Detector Control Safety (DCS) (2010-2011), **Shift Leader** (2012-today), and **Run Field Manager** (2015)

Publications

(PA = Primary Author; ED = Editor; C = Contributor; R = Review; P = Proceedings)

Precise determination of the mass of the Higgs boson and tests of compatibility of its couplings with the standard model predictions using proton collisions at 7 and 8 TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, arXiv:1412.8662, Eur. Phys. J. C 75 (2015) 212 [C]

Constraints on the spin-parity and anomalous HVV couplings of the Higgs boson in proton collisions at 7 and 8 TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, arXiv:1411.3441, Phys. Rev. D 92, 012004 [PA, ED]

Measurement of the W boson helicity in events with a single reconstructed top quark in pp collisions at $\sqrt{s} = 8$ TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, arXiv:1410.1154, JHEP01(2015)053 [R - Single Top]

Observation of the associated production of a single top quark and a W boson in pp collisions at $\sqrt{s} = 8$ TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, arXiv:1401.2942, Phys. Rev. Lett. 112, 231802. [PA]

Measurement of the t-channel single-top-quark production cross section and of the $|V_{tb}|$ CKM matrix element in pp collisions at $\sqrt{s} = 8$ TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, arXiv:1403.7366, JHEP 06 (2014) 090 [R - Single top]

Measurement of Higgs boson production and properties in the WW decay channel with leptonic final states, *CMS Collaboration (Serguei Chatrchyan et al.)*, arXiv:1312.1129, JHEP 01(2014)096 [PA]

Inclusive single top cross section at the LHC, *Rebeca Gonzalez Suarez on behalf of the CMS and ATLAS collaborations*, proceedings TOP2013, DOI:10.3204/DESY-PROC-2014-02/16 [P]

Snowmass 2013 Top quark working group report, *Top Quark Working Group Collaboration (K. Agashe et al.)*, arXiv:1311.2028 [C]

Evidence for associated production of a single top quark and W boson in pp collisions at 7 TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, arXiv:1209.3489, Phys. Rev. Lett. 110, 022003 (2013) [PA, ED]

Single top Production at $\sqrt{s} = 7$ TeV, *Rebeca Gonzalez Suarez on behalf of the CMS, ATLAS collaborations*, proceedings Moriond 2012, arXiv:1205.2786 [P]

Search for the standard model Higgs boson decaying to a W pair in the fully leptonic final state in pp collisions at $\sqrt{s} = 7$ TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, Phys.Lett. B 710 (2012) 91-113, arXiv:1202.1489 [C]

Measurement of the $t\bar{t}$ Production Cross Section in pp Collisions at 7 TeV in Lepton + Jets Events Using b-quark Jet Identification, *CMS Collaboration (Serguei Chatrchyan et al.)*, Phys.Rev. D84 (2011) 092004, arXiv:1108.3773 [C]

Higgs search prospects at the LHC, *Rebeca Gonzalez Suarez*, Nucl.Phys.Proc.Suppl. 210-211 (2011) 283-288 [P]

Measurement of W^+W^- Production and Search for the Higgs Boson in pp Collisions at $\sqrt{s} = 7$ TeV, *CMS Collaboration (Serguei Chatrchyan et al.)*, Phys.Lett. B 699 (2011) 25-47, arXiv:1102.5429 [C]

Discovery Potential for the SM Higgs Boson in the $H \rightarrow WW^* \rightarrow 2l2\nu$ channel at LHC, *Rebeca Gonzalez Suarez*, arXiv:0810.1468 [P]

A Software and Computing prototype for CMS Muon System alignment, (*Iban Cabrillo, Isidro Gonzalez Caballero, Rebeca Gonzalez Suarez...*), Journal of Physics: Conference Series 119 (2008) 072008 [P]

Public Results

(PA = Primary Author; ED = Editor; C = Contributor; R = Review)

- ‘Measurements of the differential cross section of single top-quark production in the t channel in proton-proton collisions at $\sqrt{s} = 8$ TeV’ (CMS-PAS-TOP-14-004) [R - Single top]
- ‘Search for $H \rightarrow b\bar{b}$ in association with single top quarks as a test of Higgs boson couplings’ (CMS-PAS-HIG-14-015) [C]
- ‘Combination of cross-section measurements of associated production of a single top-quark and a W boson at $\sqrt{s} = 8$ TeV with the ATLAS and CMS experiments’ (CMS-PAS-TOP-14-009) [C, R - Single top]
- ‘Constraints on Anomalous HWW Interactions using Higgs boson decays to $W+W^-$ in the fully leptonic final state’ (CMS-PAS-HIG-14-012) [PA, ED]
- ‘Constraints on anomalous HVV interactions using H to $4l$ decays’ (CMS-PAS-HIG-14-014) [C]
- ‘Search for anomalous Wtb couplings and top FCNC in t-channel single-top-quark events’ (CMS-PAS-TOP-14-007) [R - Single top]
- ‘Search for anomalous single top quark production in association with a photon’ (CMS-PAS-TOP-14-003) [R - Single top]
- ‘Search for s-channel single top-quark production in pp collisions at $\sqrt{s} = 8$ TeV’ (CMS-PAS-TOP-13-009) [R - Single top]

- ‘Measurement of top quark polarization in t-channel single-top production’ (CMS-PAS-TOP-13-001) [R - Single top]
- ‘Combination of single top-quark cross-sections measurements in the t-channel at $\sqrt{s} = 8\text{TeV}$ with the ATLAS and CMS experiments’ (CMS-PAS-TOP-12-002) [R - Single top]
- ‘Observation of Associated Production of a Single Top Quark and W Boson in pp Collisions at $\sqrt{s} = 8\text{TeV}$ ’ (CMS-PAS-TOP-12-040) [PA]
- ‘Search for Flavor-Changing Neutral Currents in tZ events in proton-proton collisions at $\sqrt{s} = 7\text{TeV}$ ’ (CMS-PAS-TOP-12-021) [R - Single top]
- ‘Measurement of the single-top t-channel charge ratio at 8 TeV’ (CMS-PAS-TOP-12-038) [R - Single top]
- ‘Measurement of W-helicity fractions in single top events topology’ (CMS-PAS-TOP-12-020) [R - Single top]
- ‘Search for single top tW associated production in the dilepton decay channel in pp collisions at $\sqrt{s} = 7\text{ TeV}$ ’ (CMS-PAS-TOP-11-022) [PA, ED]
- ‘Measurement of the top-quark pair-production cross section in the lepton+jets channel with the use of b-tagging’ (CMS-PAS-TOP-10-003) [C]
- ‘Measurement of the top-quark pair-production cross section in the di-lepton channel at 7 TeV’ (CMS-PAS-TOP-10-005) [C]
- ‘Search for $H \rightarrow WW \rightarrow 2l\ 2\nu$ ’ (CMS-PAS-HIG-10-003) [C]
- ‘Observation of WW final state’ (CMS-PAS-EWK-009) [C]
- ‘Performance of muon identification in pp collisions at $\sqrt{s} = 7\text{ TeV}$ ’ (CMS-PAS-MUO-10-002) [PA]
- ‘Search Strategy for a Standard Model Higgs Boson Decaying to Two W Bosons in the Fully Leptonic Final State’ (CMS-PAS-HIG-08-006) [PA]
- ‘Search for the Higgs boson in the WW decay channel with the CMS experiment’ (CMS-PAS-HIG-07-001) [PA]

Rebeca Gonzalez Suarez, August 11, 2015