

The CMS Muon System Alignment

Parallel given at [CHEP09: International Conference On Computing In High Energy Physics And Nuclear Physics, 21-27 Mar 2009, Prague \(Czech Republic\)](#) The talk is selected (cms speaker).

Abstract *[preliminary, not approved yet]*

The alignment of the Muon System of CMS is performed using different techniques: photogrammetry measurements, optical alignment and alignment with tracks. For track-based alignment, several methods are employed, ranging from a hit-impact point (HIP) algorithm and a procedure exploiting chamber overlaps to a global fit method based on the Millepede approach. For start-up alignment, cosmic muon and beam halo signatures play a very strong role, in particular as long as available integrated luminosity is still significantly limiting the size of the muon sample from collisions. During the last commissioning runs the first aligned geometries have been produced and validated, and have been used at the CMS offline computing infrastructure in order to perform improved reconstructions. This presentation develops the computational aspects related to the calculation of alignment constants at the CERN Analysis Facility (CAF), the production and population of databases and the validation and performance in the official reconstruction. Also the integration of track-based and other sources of alignment is discussed.

Speakers

[Pablo Martinez Ruiz Del Arbol \(Universidad de Cantabria\)](#)

Files

- [CMSMuonAlignmentCHEP09.pdf \(2701.7 kB\)](#) [Final draft approved by Rainer Mankel] ✕

Bibliography

Content Review

The content of this talk is related to the activities of one or more CMS groups listed below. The conveners or conference committee representatives of these groups have enhanced CINCO administrative rights. They will be informed by e-mail about any changes and updates to the presentation title, abstract or file upload.

- CMS: Muon Detector
- CMS: Software and Offline

Instructions

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Certificate of Presence

We hereby certify that Pablo Martínez Ruiz del Árbol, member of the CMS Collaboration, has given the following oral presentations at conferences, workshops, and seminars on the dates and places indicated below:

"Precision Timing with the CMS MIP Timing Detector" at "LP2019: 29th International Symposium on Lepton Photon Interactions at High Energies, 5-10 Aug 2019, University of Toronto, Toronto (Canada)".

"Dark matter at LHC" at "Split2018: 2018 LHC days in Split, 17-22 Sep 2018, University of Split - FESB and Faculty of Science, Split (Croatia)".

"Searches for BSM physics in the 2 leptons y MET final state" at "IX CPAN days: IX CPAN days, Centro Nacional de Partículas, Astropartículas y Nuclear, 23-25 Oct 2017, CPAN, Santander (Spain)".

"Review of Supersymmetry Searches at 13 TeV with the CMS experiment" at "DM2016: Dark Matter 2016: From the smallest to the largest scales, 27 Jun-1 Jul 2016, Santander (Spain)".

"CMS SUSY searches at 13 TeV" at "LPCC Seminar: CERN LPCC EP-LHC Seminar Series, 9 Feb 2016, Geneva (Switzerland)".

"Search for Beyond the Standard Model Physics in multi-leptonic and photonic final states with the CMS detector" at "ICHEP 2014: 37th International Conference on High Energy Physics, 2-9 Jul 2014, Valencia (Spain)".

"Searches for SUSY in events with two or more leptons at CMS" at "ICHEP 2012: International Conference on High Energy Physics, 4-12 Jul 2012, Melbourne, VIC (Australia)".

"Susy searches in the Z+Jets+MET final state in 7 TeV pp collisions with the jet-z balance method" at "Bienal RSEF: XXXIII Reunión Bienal de la Real Sociedad Española de Física, 19-23 Sep 2011, Universidad de Cantabria, Santander (Spain)".

"Commissioning and Performance of the CMS Detector" at "Blois2010: 22nd Rencontres de Blois on "Particle Physics and Cosmology; First Results from the LHC", 15-20 Jul 2010, Blois (France)".

"The CMS Muon System Alignment: First results from commissioning runs " at "BIENALFISICA09: XXXII Bienal de Física, 7-11 Sep 2009, Ciudad Real (Spain)".

"Muon Alignment in ATLAS and CMS" at "Detector Understanding with First LHC Data, 29 Jun-3 Jul 2009, DESY, Hamburg (Germany)".

"The CMS Muon System Alignment" at "CHEP09: International Conference On Computing In High Energy Physics And Nuclear Physics, 21-27 Mar 2009, Prague (Czech Republic)".


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