Ian Crotty
CERN | CERN · CMS
29.24

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RPCs Detectors

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Publications (74)

R&D of a real-size mosaic MRPC within the framework of the CMS muon upgrade

Article

Oct 2019

yu Yancheng · D. Han · Yajun Wang · [...] · Juozas Vaitkus

Based on previous experience and attempt, a real-size mosaic Multi-gap Resistive Plate Chamber (MRPC) has been developed within the framework of the CMS muon upgrade efforts. The chamber is a 5-gap with plates made each of 6 pieces of low resistive glass. Cosmic ray test at CERN 904 shows that its efficiency can reach above 95% with a gas mixture o...

View

RE3/1 and RE4/1 RPC chambers integration in the inner region of the forward muon spectrometer in the CMS experiment

Preprint

May 2019

E. Voevodina · Ian Crotty

The high pseudorapidity (η) region of the Compact Muon Solenoid (CMS) muon system is covered by Cathode Strip Chambers only and lacks redundant coverage despite the fact that it is a challenging region for muons in terms of backgrounds and momentum resolution. During the annual Year-End Technical Stops 2022 & 2023, two new layers of improved R...

View

Study of Thin Double-Gap RPCs for the CMS Muon System

Article

Oct 2018

Kwan Sik Lee · S. W. Cho · Sang H. Choi · [...] · Ian Crotty

High-sensitivity double-gap phenolic resistive plate chambers (RPCs) are studied for the Phase-2 upgrade of the Compact Muon Solenoid (CMS) muon system at high pseudorapidity η. Whereas the present CMS RPCs have a gas gap thickness of 2 mm, we propose to use thinner gas gaps, which will improve the performance of these RPCs. To validate this propos...

View

Detector control system and efficiency performance for CMS RPC at GIF++

Article Full-text available

Oct 2016

Mazlum Gul · G. Gonzalez Blanco · Anna Cimmino · [...] · Juozas Vaitkus

In the framework of the High Luminosity LHC upgrade program, the CMS muon group built several different RPC prototypes that are now under test at the new CERN Gamma Irradiation Facility (GIF++). A dedicated Detector Control System (DCS) has been developed using the WinCC-OA tool to control and monitor these prototype detectors and to store the meas...

View

Radiation tests of real-sized prototype RPCs for the Phase-2 Upgrade of the CMS Muon System

Article Full-text available

Aug 2016

Kwan Sik Lee · S.W. Cho · S.Y. Choi · [...] · Juozas Vaitkus

We report on a systematic study of double-gap and four-gap phenolic resistive plate chambers (RPCs) for the Phase-2 upgrade of the CMS muon system at high η. In the present study, we constructed real-sized double-gap and four-gap RPCs with gap thicknesses of 1.6 and 0.8 mm, respectively, with 2-mm-thick phenolic high-pressure-laminated (HPL) plates...

View

R&D towards the CMS RPC Phase-2 upgrade

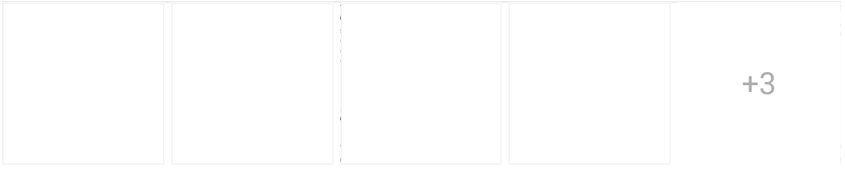
Article Full-text available

Jun 2016

Alexis Fagot · Anna Cimmino · Shannon Rebecca Crucy · [...] · Juozas Vaitkus

The high pseudo-rapidity region of the CMS muon system is covered by Cathode Strip Chambers (CSC) only and lacks redundant coverage despite the fact that it is a challenging region for muons in terms of backgrounds and momentum resolution. In order to maintain good efficiency for the muon trigger in this region additional RPCs are planned to be ins...

View



Radiation Tests of Real-Sized Prototype RPCs for the Future CMS RPC Upscope

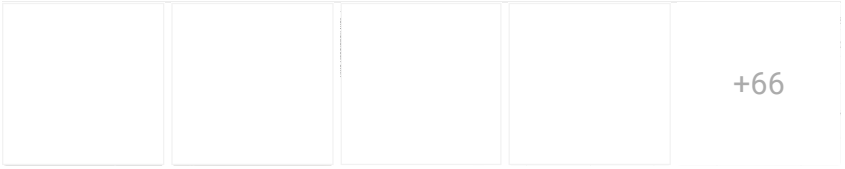
Article Full-text available

May 2016

Kwan Sik Lee · Sang H. Choi · B. S. Hong · [...] · Juozas Vaitkus

We report on a systematic study of double-gap and four-gap phenolic resistive plate chambers (RPCs) for future high-{\eta} RPC triggers in the CMS. In the present study, we constructed real-sized double-gap and four-gap RPCs with gap thicknesses of 1.6 and 0.8 mm, respectively, with 2-mm-thick phenolic high-pressure-laminated (HPL) plates. We exami...

View



CMS TECHNICAL DESIGN REPORT FOR THE MUON ENDCAP GEM UPGRADE Editors Chapter Editors Language Editors Cover Design

Technical Report Full-text available

Sep 2015

A Colaleo · A Safonov · Ashutosh Sharma · [...] · Elizabeth Starling

This report describes both the technical design and the expected performance of the Phase-II upgrade, using Gas Electron Multiplier (GEM) detectors, of the first endcap station of the CMS muon system. The upgrade is targeted for the second long shutdown of the CERN LHC and is designed to improve the muon trigger and tracking performance at high lum...

designed to improve the muon trigger and tracking performance at high lum...

View

Nuclear Instruments and Methods in Physics Research A 617 (2010) 180–182

Data Full-text available

Aug 2013

Davide Piccolo · N Darmenov · Vladimir Genchev · [...] · Sungeun Lee

View

CR2009 196[1]

Data Full-text available

Aug 2013

Davide Piccolo · N Darmenov · Vladimir Genchev · [...] · Sungeun Lee

View

A New Boson with a Mass of 125 GeV Observed with the CMS Experiment at the Large Hadron Collider

Article Full-text available

Dec 2012

D. Abbaneo · G. Abbiendi · Marcello Abbrescia · [...] · P. Zych

The Higgs boson was postulated nearly five decades ago within the framework of the standard model of particle physics and has been the subject of numerous searches at accelerators around the world. Its discovery would verify the existence of a complex scalar field thought to give mass to three of the carriers of the electroweak force—the W+, W−, an...

View

High-rate glass resistive plate chambers for LHC muon detectors upgrade

Conference Paper

Oct 2012

Imad Laktineh · L. Caponetto · S. Cauwenbergh · [...] · N. Zaganidis

The limitation of the detection rate of standard bakelite resistive plate chambers (RPC) used as muon detector in LHC experiments is behind the absence of such detectors in the high η regions in both CMS and ATLAS detectors. RPCs made with low resistivity glass plates (1010 Ω.cm) could be an adequate solution to equip the high TJ regions extending...

View

Resistive Plate Chambers performance with Cosmic Rays in the CMS experiment

Article Full-text available

May 2010

Davide Piccolo · N. Darmenov · Vladimir Genchev · [...] · S E Lee

The Resistive Plate Chambers [M. Abbrescia, et al., Nucl. Instr. and Meth. A 550 (2005) 1161 are used in the CMS experiment [CMS Collaboration, The CMS experiment at the CERN LHC 2008, J. Inst. 3 (2008) S08004] as a dedicated muon trigger both in barrel and endcap system. About 4000 m(2) of double gap RPCs have been produced and have been installed...

View

Performance Study of the CMS Barrel Resistive Plate Chambers with Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; In October and November 2008, the CMS collaboration conducted a programme of cosmic ray data taking, which has recorded about 270 million events. The Resistive Plate Chamber system, which is part of the CMS muon detection system, was successfully operated in the full barrel. More than 98% of the channels were operati...

View

Aligning the CMS Muon Chambers with the Muon Alignment System during an Extended Cosmic Ray Run

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The alignment system for the muon spectrometer of the CMS detector comprises three independent subsystems of optical and analog position sensors. It aligns muon chambers with respect to each other and to the central silicon tracker. System commissioning at full magnetic field began in 2008 during an extended cosmic r...

View

Commissioning of the CMS High-Level Trigger with Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS High-Level Trigger (HLT) is responsible for ensuring that data samples with potentially interesting events are recorded with high efficiency and good quality. This paper gives an overview of the HLT and focuses on its commissioning using cosmic rays. The selection of triggers that were deployed is presented a...

View

Measurement of the Muon Stopping Power in Lead Tungstate

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; A large sample of cosmic ray events collected by the CMS detector is exploited to measure the specific energy loss of muons in the lead tungstate of the electromagnetic calorimeter. The measurement spans a momentum range from 5 GeV/c to 1 TeV/c. The results are consistent with the expectations over the entire range....

View

Commissioning and Performance of the CMS Pixel Tracker with Cosmic Ray Muons

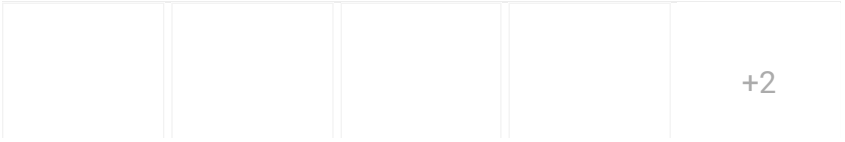
Article Full-text available

Mar 2010

Sergey Chatrchyan · K Abadjiev · D Abbaneo · [...] · P Zych

Compact Muon Solenoid at LHC; The pixel detector of the Compact Muon Solenoid experiment consists of three barrel layers and two disks for each endcap. The detector was installed in summer 2008, commissioned with charge injections, and operated in the 3.8 T magnetic field during cosmic ray data taking. This paper reports on the first running expe...

View



+2

Precise Mapping of the Magnetic Field in the CMS Barrel Yoke using Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS detector is designed around a large 4 T superconducting solenoid, enclosed in a 12000-tonne steel return yoke. A detailed map of the magnetic field is required for the accurate simulation and reconstruction of physics events in the CMS detector, not only in the inner tracking region inside the solenoid but al...

View

Commissioning of the CMS Experiment and the Cosmic Run at Four Tesla

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS Collaboration conducted a month-long data-taking exercise known as the Cosmic Run At Four Tesla in late 2008 in order to complete the commissioning of the experiment for extended operation. The operational lessons resulting from this exercise were addressed in the subsequent shutdown to better prepare CMS for...

View

Performance of CMS Hadron Calorimeter Timing and Synchronization using Test Beam, Cosmic Ray, and LHC Beam Data

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; This paper discusses the design and performance of the time measurement technique and of the synchronization systems of the CMS hadron calorimeter. Time measurement performance results are presented from test beam data taken in the years 2004 and 2006. For hadronic showers of energy greater than 100 GeV, the timing r...

View

Identification and Filtering of Uncharacteristic Noise in the CMS Hadron Calorimeter

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; Commissioning studies of the CMS hadron calorimeter have identified sporadic uncharacteristic noise and a small number of malfunctioning calorimeter channels. Algorithms have been developed to identify and address these problems in the data. The methods have been tested on cosmic ray muon data, calorimeter noise data...

View

CMS Data Processing Workflows during an Extended Cosmic Ray Run

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS Collaboration conducted a month-long data taking exercise, the Cosmic Run At Four Tesla, during October-November 2008, with the goal of commissioning the experiment for extended operation. With all installed detector systems participating, CMS recorded 270 million cosmic ray events with the solenoid at a magn...

View

Performance of the CMS Drift Tube Chambers with Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; Studies of the performance of the CMS drift tube barrel muon system are described, with results based on data collected during the CMS Cosmic Run at Four Tesla. For most of these data, the solenoidal magnet was operated with a central field of 3.8 T. The analysis of data from 246 out of a total of 250 chambers indica...

View

Calibration of the CMS Drift Tube Chambers and Measurement of the Drift Velocity with Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; This paper describes the calibration procedure for the drift tubes of the CMS barrel muon system and reports the main results obtained with data collected during a high statistics cosmic ray data-taking period. The main goal of the calibration is to determine, for each drift cell, the minimum time delay for signals r...

View

Fine Synchronization of the CMS Muon Drift-Tube Local Trigger using Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS experiment uses self-triggering arrays of drift tubes in the barrel muon trigger to perform the identification of the correct bunch crossing. The identification is unique only if the trigger chain is correctly synchronized. In this paper, the synchronization performed during an extended cosmic ray run is desc...

View

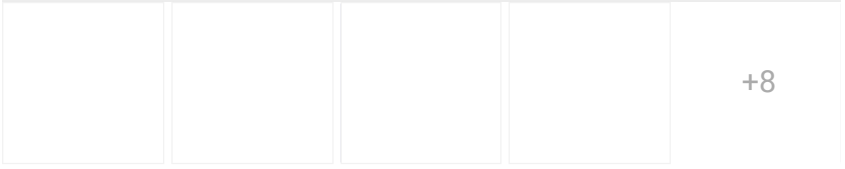
Resistive Plate Chambers performance with Cosmic Rays in the CMS experiment

Article

Jan 2010

Davide Piccolo · N. Darmenov · Vladimir Genchev · [...] · S. E. Lee

View



Performance of the CMS Cathode Strip Chambers with Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The Cathode Strip Chambers (CSCs) constitute the primary muon tracking device in the CMS endcaps. Their performance has been evaluated using data

taken during a cosmic ray run in fall 2008. Measured noise levels are low, with the number of noisy channels well below 1%. Coordinate resolution was measured for all types...

View

Performance of the CMS Level-1 Trigger during Commissioning with Cosmic Ray Muons

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS Level-1 trigger was used to select cosmic ray muons and LHC beam events during data-taking runs in 2008, and to estimate the level of detector noise. This paper describes the trigger components used, the algorithms that were executed, and the trigger synchronisation. Using data from extended cosmic ray runs,...

View

Alignment of the CMS Muon System with Cosmic-Ray and Beam-Halo Muons

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS muon system has been aligned using cosmic-ray muons collected in 2008 and beam-halo muons from the 2008 LHC circulating beam tests. After alignment, the resolution of the most sensitive coordinate is 80 microns for the relative positions of superlayers in the same barrel chamber and 270 microns for the relativ...

View

Time Reconstruction and Performance of the CMS Electromagnetic Calorimeter

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The resolution and the linearity of time measurements made with the CMS electromagnetic calorimeter are studied with samples of data from test beam electrons, cosmic rays, and beam-produced muons. The resulting time resolution measured by lead tungstate crystals is better than 100 ps for energy deposits larger than 1...

View

Performance of the CMS Drift-Tube Local Trigger with Cosmic Rays

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The performance of the Local Trigger based on the drift-tube system of the CMS experiment has been studied using muons from cosmic ray events collected during the commissioning of the detector in 2008. The properties of the system are extensively tested and compared with the simulation. The effect of the random arriv...

View

Performance of the CMS Hadron Calorimeter with Cosmic Ray Muons and LHC Beam Data

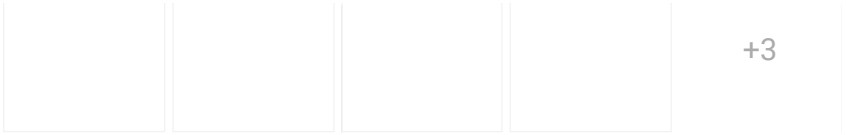
Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; The CMS Hadron Calorimeter in the barrel, endcap and forward regions is fully commissioned. Cosmic ray data were taken with and without magnetic field at the surface hall and after installation in the experimental hall, hundred meters underground. Various measurements were also performed during the few days of beam i...

View



Commissioning and Performance of the CMS Silicon Strip Tracker with Cosmic Ray Muons

Article Full-text available

Mar 2010

Sergey Chatrchyan · Vardan Khachatryan · Albert Sirunyan · [...] · A. White

Compact Muon Solenoid at LHC; During autumn 2008, the Silicon Strip Tracker was operated with the full CMS experiment in a comprehensive test, in the presence of the 3.8 T magnetic field produced by the CMS superconducting solenoid. Cosmic ray muons were detected in the muon chambers and used to trigger the readout of all CMS sub-detectors. About...

View

Development of RE1/1 RPCs for the CMS muon trigger system

Article

May 2009

Sangho Park · S.H. Ahn · Sergey Aleksandrovich Akimenko · [...] · Z.H. Xue

The first six Resistive Plate Chambers (RPCs) of RE1/1 in the forward region of the Compact Muon Solenoid (CMS) detector were constructed and are being tested. These RPCs cover the pseudo-rapidity region from 1.6 to 2.1 and will serve as the base detector for the CMS RPC muon trigger. We report that these six RPCs are being tested with the CMS RPC...

View

The CMS experiment at the CERN LHC

Article Full-text available

Aug 2008

The CMS Collaboration · Sergey Chatrchyan · Gevorg Hmayakyan · [...] · Bekhzod Sadykovich. Yuldashev

The Compact Muon Solenoid (CMS) detector is described. The detector operates at the Large Hadron Collider (LHC) at CERN. It was conceived to study proton-proton (and lead-lead) collisions at a centre-of-mass energy of 14 TeV (5.5 TeV nucleon-nucleon) and at luminosities up to 1034 cm−2 s−1 (1027 cm−2 s−1). At the core of the CMS detector sits a hig...

View

The first applications of newly developed gaseous detectors with resistive electrodes for UV imaging in daylight conditions

Article

Oct 2007

J.-M. Bidault · Ian Crotty · Antonio Di Mauro · [...] · O. Zanette

We have demonstrated experimentally that recently developed gaseous detectors with resistive electrodes, combined with solid or gaseous photocathodes have low noise and high quantum efficiency for UV photons while being solar blind. For this reason, they can be used for the detection of weak UV sources in daylight conditions. These detectors are ex...

View

CMS expression of interest in the SLHC

Article Full-text available

Mar 2007

J. Nash · D. Acosta · W. Smith · [...] · Bekhzod Sadykovich. Yuldashev

View

The first applications of novel gaseous detectors for UV visualization

Article Full-text available

Jan 2007

J-M. Bidault · Ian Crotty · Antonio Di Mauro · [...] · O. Zanette

We have demonstrated experimentally that recently developed gaseous detectors combined with solid or gaseous photo-cathodes have exceptionally low noise and high quantum efficiency for UV photons while being solar blind. For this reason they can be used for the detection of weak UV sources in daylight conditions. These detectors are extremely robus...

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CMS expression of interest in the SLHC

Article Full-text available

Jan 2007

J. Nash · D. Acosta · W. Smith · [...] · Bekhzod Sadykovich. Yuldashev

View

CMS physics technical design report: Addendum on high density QCD with heavy ions

Article

Jan 2007

G.L. Bayatian · Sergey Chatrchyan · Gevorg Hmayakyan · [...] · Bekhzod Sadykovich. Yuldashev

View

CMS Physics Technical Design Report, Volume II: Physics Performance

Article Full-text available

Jan 2007

G. L. Bayatian · Sergey Chatrchyan · Gevorg Hmayakyan · [...] · Bekhzod Sadykovich. Yuldashev

CMS is a general purpose experiment, designed to study the physics of pp collisions at 14 TeV at the Large Hadron Collider (LHC). It currently involves more than 2000 physicists from more than 150 institutes and 37 countries. The LHC will provide extraordinary opportunities for particle physics based on its unprecedented collision energy and lumin...

View

CMS Physics Technical Design Report: Addendum on High Density QCD with Heavy Ions

Article Full-text available

Jan 2007

G.L. Bayatian · Sergey Chatrchyan · Gevorg Hmayakyan · [...] · Bekhzod Sadykovich. Yuldashev

This report presents the capabilities of the CMS experiment to explore the rich heavy-ion physics programme offered by the CERN Large Hadron Collider (LHC). The collisions of lead nuclei at energies , will probe quark and gluon matter at unprecedented values of energy density. The prime goal of this research is to study the fundamental theory of th...

View

Cosmic Ray Test Certification of the First 100 CMS Endcap RPCs and the Corresponding Construction Database

Article

Aug 2006

A. Ball · J.-P. Chatelain · Ian Crotty · [...] · M. Maggi

In June 2004, production began for the first set of Resistive Plate Chambers (RPCs), which will be installed in the endcap of the CMS experiment at the CERN Large Hadron Collider (LHC). More than 140 such “RE” chambers have been produced and about 100 of them have been tested with cosmic rays. The detectors are assembled at CERN with gas gaps made...

View

Production and the quality control for the CMS endcap RPCs

Article

Aug 2006

Z. Aftab · Ikhlak Ahmed · S. H. Ahn · [...] · J. Ying

The production for the endcap RPCs in the CMS experiment has entered a mature stage of the production stream. In this paper, the production facilities and the selection procedures of the qualified RPC gaps axe presented. The mass production and the quality control tests for the endcap RPCs have reached the maximum productivity. The yield to produce...

View

Assembly and Quality Certification for the First Station of CMS Endcap RPCs (RE1)

Article

Aug 2006

Z. Aftab · Ijaz Ahmed · S.H. Ahn · [...] · J. Ying

The production of Resistive Plate Chambers (RPCs) for the first Endcap station (REI) of CMS

experiment at Large Hadron Collider (LHC) has started at CERN since June 2004. For good performance of CMS muon and trigger systems these chambers have been assembled in accordance with strict QC (quality control) and QA (quality assurance) procedures during...

View

CMS Physics : Technical Design Report Volume 1: Detector Performance and Software

Article Full-text available

Jan 2006

Bayatian G L · Sergey Chatrchyan · Gevorg Hmayakyan · [...] · Bekhzod Sadykovich. Yuldashev

http://cds.cern.ch/record/922757

View

Assembly and Quality Certification for the First Station of CMS Endcap RPCs (RE1)

Article

Jan 2006

Z. Aftab · Ijaz Ahmed · S. H. Ahn · [...] · Ian Crotty

The production of Resistive Plate Chambers (RPCs) for the first Endcap station (RE1) of CMS experiment at Large Hadron Collider (LHC) has started at CERN since June 2004. For good performance of CMS muon and trigger systems these chambers have been assembled in accordance with strict QC (quality control) and QA (quality assurance) procedures during...

View

Advanced Photodetectors for Hyperspectroscopy and Other Applications

Article Full-text available

Dec 2005

I. Rodionov · J-M. Bidault · Ian Crotty · [...] · O. Zanette

Hyperspectroscopy is a new method of surface image taking, providing simultaneously high position and spectral resolutions which allow one to make some conclusions about chemical compositions of the surfaces. We are now studying applications of the hyperspctroscopic technique to be used for medicine. This may allow one to develop early diagnostics...

View

Advanced gaseous photodetectors for hyperspectroscopy and other applications

Conference Paper Full-text available

Nov 2005

I. Rodionov · J.-M. Bidault · Ian Crotty · [...] · O. Zanette

Hyperspectroscopy is a new method of surface image taking, providing simultaneously high position and spectral resolutions which allow one to make some conclusions about chemical compositions of the surfaces. For image taking advanced MCPs are currently used, sensitive in the spectral interval of 450-850 nm. One of the aims of this work is to exten...

View

Beam test of the first production forward RPC

Article Full-text available

Jan 2004

Yong Ban · Jianxin Cai · Hongtao Liu · [...] · Itlay

The production of the first set of forward Resistive Plate Chambers (RPC) for the CMS experiment at the Large Hadron Collider (LHC) has started at CERN since June 2004. The detectors are assembled with gas gaps made in Korea, mechanics made in China and are equipped with the final front-end electronics, high/low-voltage distribution and threshold c...

View

High-rate, high-position resolution microgap RPCs for X-ray imaging applications

Article

Jun 2003

Ian Crotty · P. Fonte · T. Francke · [...] · J. Rantanen

We have developed small prototypes (5×5 and 10×10 cm2) of a new type of micropattern detector—a microgap RPC made of commercially available low resistivity (ρ~104–108 Ω cm) materials having a position resolution better than 50 μm FWHM and capable of operating at counting rates up to 107 Hz/cm2. The main advantage of these detectors compared to trad...

View

View

Performance of the first RPC station prototype for the CMS barrel detector

Article

Dec 2000

Marcello Abbrescia · Saverio Altieri · G. Belli · [...] · Paolo Vitulo

A full-size prototype of the second barrel RPC station (RB2) for the CMS detector has been tested under high-irradiation flux at the CERN Gamma Irradiation Facility (GIF) during the 1999 beam test. The main requirements of RPCs as trigger detector have been studied: cluster size, time resolution, efficiency and rate capability. The timing features...

View

Pure avalanche mode operation of a 2 mm gap resistive plate chamber

Article

Sep 1997

E Cerron Zeballos · Ian Crotty · D Hatzifotiadou · [...] · A Zichichi

It is necessary to operate the resistive plate chamber (RPC) in avalanche mode to obtain high efficiency at elevated particle fluxes. We examine this mode of operation with a 2 mm gap RPC using gas mixtures containing C2F4H2 and C2F5H. In order to explain the data we propose that the avalanche growth is strongly limited by space charge effects.

View

Resistive plate chambers with secondary electron emitters and microstrip readout

Article

Jun 1997

E. Ceron Zeballos · Ian Crotty · D. Hatzifotiadou · [...] · Vladimir Peskov

We describe our attempt to develop Resistive Plate Chambers (RPCs). One study involves the use of secondary electron emitters that consist of porous photosensitive materials (CsI, diethylferocenil-mercury, SbCs and others) deposited on a cathode; this enhances efficiency, thus allowing the use of light, non-flammable gas mixtures. The other study c...

View

Latest results from the multigap resistive plate chamber

Article

Jun 1997

E. Cerron Zeballos · Ian Crotty · D. Hatzifotiadou · [...] · A. Zichichi

We present the current status of the multigap resistive plate chamber. Our device has resistive plates made of melamine and is operated in avalanche mode with argon-based gases with a small percentage of quencher (CO2, isobutane, etc). It has excellent time resolution (σ = 1.5−2 ns) and rate capability (>98% efficiency at 1 kHzcm2); in addition, it...

View

A new resistive plate chamber with secondary electron emitters and two dimensional microstrip readout

Conference Paper Full-text available

Dec 1996

Ian Crotty · P. Fonte · D. Lemenovski · Vladimir Peskov

We describe a resistive plate chambers with improved rate characteristics, equipped with high efficiency secondary electron emitters and a two-dimensional microstrip readout

View

Investigation of anomalous heat production in Ni−H systems

Article Full-text available

Dec 1996

E. Cerron-Zeballos · Ian Crotty · D. Hatzifotiadou · [...] · A. Zichichi

Anomalous heat production in a nickel rod loaded with hydrogen has been reported by Focardiet al. (Nuovo Cimento A,107 (1994) 163). We have investigated this phenomenon by repeating the experiment. We found the results previously published to be consistent with our observations; namely we measured higher temperatures for the same input power when h...

View

Avalanche fluctuations within the multigap resistive plate chamber

Article

Nov 1996

E. Cerron Zeballos · Ian Crotty · D. Hatzifotiadou · [...] · A. Zichichi

The multigap resistive plate chamber (MRPC) was originally designed to have improved time resolution (compared to the wide gap RPC), but also to keep the good high rate behaviour and ease of construction associated with the wide gap RPC. However in addition we observed a very long efficiency plateau, even at high rates. Here we consider fluctuation...

View

A new type of resistive plate chamber: The multigap RPC

Article

May 1996

E Cerron Zeballos · Ian Crottv · D Hatzifotiadou · [...] · A Zichichi

This Letter describes the multigap resistive plate chamber (RPC). The goal is to obtain a much improved time resolution, keeping the advantages of the wide gap RPC in comparison with the conventional narrow gap RPC (smaller dynamic range and thus lower charge per avalanche which gives higher rate capability and lower power dissipation in the gas ga...

View

A comparison of the wide gap and narrow gap resistive plate chamber

Article

Apr 1996

E Cerron-Zeballos · Ian Crotty · D Hatzifotiadou · [...] · Antonino Zichichi

In this paper we study the performance of a wide gap RPC and compare it with that of a narrow gap RPC, both operated in avalanche mode. We have studied the total charge produced in the avalanche. We have measured the dependence of the performance with rate. In addition we have considered the effect of the tolerance of gas gap and calculated the pow...

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Upnit Power Corporation

Article

Jan 1996

E.C. Zeballos · Ian Crotty · D. Hatzifotiadou · [...] · A. Zichichi

View

High rate resistive plate chambers

Article

Dec 1995

E. Cerron Zeballos · Ian Crotty · D. Hatzifotiadou · [...] · A. Zichichi

In this paper we consider some factors that could improve the high rate performance of the RPC; we consider the role of freon in the operation of RPCs; we present results with an asymmetric RPC with one glass and one melamine resistive plate.

View

A high-rate, high-resolution asymmetric wire chamber with microstrip readout

Article Full-text available

Jul 1995

Georges Charpak · Ian Crotty · Ioanis Giomataris · [...] · Crispin Williams

View

The wide gap resistive plate chamber

Article

Jun 1995

Ian Crotty · E Cerron Zeballos · Jose Lamas · [...] · A Zichichi

The resistive plate chamber (RPC) has good time and position resolution; these factors (coupled to its simple construction) make it an attractive candidate for muon trigger systems at future colliders. However, operated in spark mode, the RPC has severe rate problems that make it unusable above 10 Hz/cm2. We have previously published our results co...

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A high-rate, high-resolution asymmetric wire chamber with mustrip readout

Article

Aug 1994

Georges Charpak · Ian Crotty · Y. Giomataris · [...] · Crispin Williams

We have investigated the properties of an asymmetric wire chamber with cathode strip readout. The use of a small gap between the anode plane and the cathode plane and of an electric field configuration provide fast removal of the positive ions produced in the avalanche process and restrict the area of the induced signal on strips engraved on the ca...

View

Further studies of avalanche mode operation of resistive parallel plate chambers

Article

Jul 1994

Ian Crotty · Jose Lamas · Giuliano Laurenti · [...] · A. Zichichi

We have investigated the high rate operation of the resistive plate chamber and have discovered that melamine-phenolic laminates are good candidates for a plate material. We have previously shown that avalanche mode (rather than spark mode) gives a substantial improvement in the rate capability. There are two new encouraging results; the timing spe...

View

The non-spark mode and high rate operation of resistive parallel plate chambers

Article

Jan 1994

Ian Crotty · Jose Lamas · Giuliano Laurenti · [...] · A. Zichichi

The good time and position resolution of the resistive plate chamber (RPC) make it an attractive candidate for muon trigger systems at future colliders. However, this device has severe rate problems that make it unusable above 1 Hz/cm2 in its present form. We have investigated

problems that make it unusable above 1 Hz/cm2 in its present form. We have investigated various materials and have also discovered a new mode of operation that...

View

Investigation of resistive parallel plate chambers

Article

May 1993

Ian Crotty · Jose Lamas · Giuliano Laurenti · [...] · Antonino Zichichi

The resistive parallel plate chamber (RPC) has been developed during the last ten years. We have investigated two versions of these chambers, one with cellulose and the other with phenolic plates. We present a comparison between these two for various gas mixtures and the dependence on particle flux.

View

Acoplanar Di-leptons and Mixed events on the basis of two supergravity model predictions

Article

Jan 1993

Francesco Anselmo · G. Anzivino · F. Arzarello · [...] · A. Zichichi

Purpose of this note is to propose a search for typical signatures produced by charginos, neutralinos and sleptons on the basis of two supergravity model predictions, at the highest e+ e− energy which will be available with LEP-II. The typical signatures are of two main classes: i) «pure leptonic» states; ii) «mixed lepton-jets» states. The «pure l...

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Advances in Technology for High-Energy Subnuclear Physics. Contribution of the LAA Project.

Article Full-text available

Nov 1990

LAA Collaboration · A. Zichichi · D Acosta · [...] · K Zografos

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The LAA project

Article

May 1990

G. Anzivino · M. Arneodo · F. Arzarello · [...] · K. Zographos

View

Test beam Results of the Forward RPC Prototype Chamber for the CMS Muon Detector

Article Full-text available

Z Aftab · Hafeez Hoorani · Javed Alam Jan · [...] · Ian Crotty

A full size prototype of the second forward RPC station (RE2/2) for the CMS detector has been tested during the 2000 beam test. The prototype was exposed to high irradiation flux using the CERN Gamma Irradiation Facility (GIF) and the 200 GeV muon beam from X5 beamline. We have studied number of chamber parameters which are relevant for the trigger...

View

Study and optimization of RPCs for high rate applications

Article Full-text available

P J Carlson · Ian Crotty · Peter Cwetanski · [...] · Ashutosh Sharma

Due to the low cost, good time resolution and the properties of RPCs with respect to electronics damage protection, they are chosen for many large experiments. These detectors are reliable and stable in their operation with counting rates up to kHz/cm2. The aim of this work is to understand the fundamental rate limits of RPCs in order to find an ef...

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