

Workshop on Tracking Detectors in High Energy Physics

Report of Contributions

Contribution ID: 0

Type: **not specified**

Welcome Session

Monday 25 May 2015 09:10 (20 minutes)

Contribution ID: 1

Type: **not specified**

Prof. Hafeez R Hoorani

Monday 25 May 2015 09:30 (30 minutes)

Presenter: HOORANI, Hafeez (National Centre for Physics (PK))

Contribution ID: 2

Type: **not specified**

Prof. Shaukat Hameed Khan

Monday 25 May 2015 10:00 (50 minutes)

Presenter: Prof. HAMEED KHAN, Shaukat (COMSTECH, Islamabad)

Contribution ID: 3

Type: **not specified**

Tea Break

Contribution ID: 4

Type: **not specified**

The ALICE tracker and its performance

Monday 25 May 2015 11:10 (50 minutes)

Physics of CMS Tracker Detector

Presenter: Prof. SALEEM BHATTI, Arshad (CIIT, Islamabad)

Contribution ID: 5

Type: **not specified**

Prof. M. Asghar Hashmi

Presenter: Prof. HASHMI, Muhammad Asghar (Islamia University Bahawalpur, Bahawalpur)

Contribution ID: 6

Type: **not specified**

Dr. Ashfaq Ahmad

Monday 25 May 2015 13:30 (50 minutes)

Presenter: AHMAD, Ashfaq (National Centre for Physics (PK))

Contribution ID: 7

Type: **not specified**

Prof. M Asghar Hashmi

Monday 25 May 2015 14:20 (50 minutes)

Presenter: Prof. HASHMI, M. Asghar (Islamia University Bahawalpur, Bahawalpur)

Contribution ID: 8

Type: **not specified**

The ATLAS Silicon trackers and its performance

Monday 25 May 2015 15:40 (50 minutes)

Silicon detectors are at the heart of the ATLAS experiment and play a crucial role in physics program pursued at the LHC. They used for precision position tracking and momentum reconstruction as well as particle identification. I will discuss the ATLAS detector with special emphasis on silicon tracking technology, front-end electronics, and the challenges in detector design for the LHC environment.

Presenter: TSYBYSHEV, Dmitry (State University of New York (US))

Contribution ID: 9

Type: **not specified**

Structural Comparison between silicon detectors and Si solar cells

Tuesday 26 May 2015 09:10 (50 minutes)

Presenter: Dr ALI, M Adnan (Government College University, Faisalabad)

Contribution ID: **10**

Type: **not specified**

Dr. M. Irfan Asghar

Tuesday 26 May 2015 10:00 (50 minutes)

Presenter: ASGHAR, Muhammad Irfan (National Centre for Physics (PK))

Contribution ID: **11**

Type: **not specified**

Imran Malik Awan

Tuesday 26 May 2015 11:10 (25 minutes)

Presenter: AWAN, Imran (National Centre for Physics (PK))

Contribution ID: **12**

Type: **not specified**

Hassan Shahzad

Tuesday 26 May 2015 11:35 (25 minutes)

Presenter: SHAHZAD, Hassan (National Centre for Physics (PK))

Contribution ID: 13

Type: **not specified**

The CMS strip tracker and its performance

Presenter: HREUS, Tomas (Universitaet Zuerich (CH))

Contribution ID: 14

Type: **not specified**

Physics of diamond detectors

Tuesday 26 May 2015 14:20 (50 minutes)

Diamond can be used as active medium in ionizing particle detectors. The principle is very similar to an ionization chamber. An applied electric field separates the charge carriers, created by ionization, and the charge drift is measured as a detector current.

Diamond is often used in a similar fashion as silicon detectors, but show different detector performance. Fast signals, good radiation hardness and low leakage current even after irradiation are some of the unique qualities of diamond detectors.

During the lecture we will discuss diamond material and artificial growth of diamond, electrical contacts and electrical properties of diamond detectors. The radiation hardness of diamond is widely regarded as very good and some insight to radiation hardness is given. Electric field effects due to polarization will be discussed.

At the CMS experiment diamond detectors are used in the Beam Condition Monitors (BCM). The BCM systems will be shown as an application of diamond detectors.

Presenter: GUTHOFF, Moritz (CERN)

Contribution ID: **15**

Type: **not specified**

Atiq-ur-Rehman

Tuesday 26 May 2015 15:30 (25 minutes)

Presenter: UR RAHMAN, Atiq (National Centre for Physics (PK))

Contribution ID: **16**

Type: **not specified**

Waqas Khalid

Tuesday 26 May 2015 15:55 (25 minutes)

Presenter: Mr KHALID, Waqas (Quaid-i-Azam University, Islamabad)

Contribution ID: 17

Type: **not specified**

Dr. M Sultan

Wednesday 27 May 2015 09:10 (30 minutes)

Presenter: Dr SULTAN, M (National Centre for Physics, Islamabad)

Contribution ID: **18**

Type: **not specified**

Dr. M. Usman

Wednesday 27 May 2015 09:40 (35 minutes)

Presenter: Dr USMAN, M (EPD, National Centre for Physics, Islamabad)

Contribution ID: **19**

Type: **not specified**

Dr. M. Azhar Nameem

Wednesday 27 May 2015 10:15 (35 minutes)

Presenter: Dr NAEEM, M Azhar (Department of Electrical Engineering, College of Engineering and Emerging Technologies. Punjab University, Lahore)

Contribution ID: 20

Type: **not specified**

The Physics of Silicon Detectors for HEP Applications

Silicon detectors play an important role in tracking in today's High Energy Physics experiments. They are widely used in vertex detectors and the developments of the past decades have greatly improved performance with respect to resolution and radiation tolerance. The contribution will give an introduction to the underlying physics and the most important characteristics of silicon detectors. The design and production of position-sensitive devices will be highlighted together with the basics about radiation damage and the design of radiation-hard devices. Furthermore, the most widely used and most promising types of detectors for future applications will be introduced briefly.

Presenter: AUZINGER, Georg (CERN)

Contribution ID: 21

Type: **not specified**

Operation and performance of the CMS pixel detector

Wednesday 27 May 2015 14:20 (50 minutes)

The CMS tracker detector comprises two tracking devices utilizing semiconductor technology: the pixel and strip detectors. They are operating in a high-occupancy and high-radiation environment created by the beam interactions in the Large Hadron Collider (LHC). The pixel occupies the innermost region of the CMS detector providing the closest measurement points for charged particles produced in the LHC collisions. After introducing the detector, the presentation will describe the operational experiences collected during the first three years of LHC running. It will include operational challenges encountered during data taking. Some details will be given on the performance at high occupancy with respect to local observables, such as cluster properties and hit reconstruction efficiency, and on performance degradation due to radiation effects.

Presenter: VESZPREMI, Viktor (Wigner RCP, Budapest (HU))

Contribution ID: **22**

Type: **not specified**

Asif

Presenter: SADDIQUE, Asif (National Centre for Physics (PK))

Contribution ID: 23

Type: **not specified**

The Physics of Silicon Detectors for HEP Applications

Tuesday 26 May 2015 13:30 (50 minutes)

Silicon detectors play an important role in tracking in today's High Energy Physics experiments. They are widely used in vertex detectors and the developments of the past decades have greatly improved performance with respect to resolution and radiation tolerance. The contribution will give an introduction to the underlying physics and the most important characteristics of silicon detectors. The design and production of position-sensitive devices will be highlighted together with the basics about radiation damage and the design of radiation-hard devices. Furthermore, the most widely used and most promising types of detectors for future applications will be introduced briefly.

Presenter: AUZINGER, Georg (CERN)

Contribution ID: 24

Type: **not specified**

Performance of the CMS Strip detector and Phase 2 upgrade

Wednesday 27 May 2015 13:30 (50 minutes)

The CMS Silicon Tracker is the largest silicon detector ever built, containing 10 million readout channels. This presentation will cover the operational experience during the Run1 period and the commissioning during LS1, including challenges and detector status before the Run2 period. The Phase 2 upgrade of the LHC machine, scheduled in 2020s, will bring the luminosity up to around $5 \cdot 10^{34} \text{ cm}^2/\text{s}$ and will possibly reach an integrated luminosity of 3000/fb at the end of that phase. CMS will therefore need a completely new, radiation resistant Tracker detector with trigger capabilities. I will also discuss the design choices and ongoing performance studies to explore options for the Phase2 Outer Tracker detector.

Presenter: HREUS, Tomas (Universitaet Zuerich (CH))