

11th RD50 Workshop

Report of Contributions

Contribution ID: 0

Type: **not specified**

Workshop Welcome

Monday, 12 November 2007 09:00 (15 minutes)

Presenters: Prof. BRUZZI, Mara (INFN and University of Florence); MOLL, Michael (CERN)

Session Classification: Workshop Welcome

Contribution ID: 2

Type: **not specified**

RD50 common wafer orders - present status

Monday, 12 November 2007 18:00 (15 minutes)

Several types of silicon wafers (FZ, MCZ, EPI0) have been ordered via RD50 - A brief overview of the status is given.

Primary author: MOLL, Michael (CERN)

Presenter: MOLL, Michael (CERN)

Session Classification: Collaboration Board Meeting

Contribution ID: 3

Type: **not specified**

Epitaxial silicon detectors irradiated with protons and neutrons

Monday, 12 November 2007 16:30 (20 minutes)

A series of epitaxial detectors of 150 μm thickness produced by different producers (IRST, CNM, HIP) will be compared to each other (CV,IV,CCE) after proton and neutron irradiation.

Primary author: KASKA, Katharina (CERN, Technische Universitaet Wien)

Co-author: MOLL, Michael

Presenter: KASKA, Katharina (CERN, Technische Universitaet Wien)

Session Classification: Pad Detector Characterization & Defect Engineering

Track Classification: Defect Engineering and Pad Detector Characterization

Contribution ID: 4

Type: **not specified**

Thin Planar Detectors: Status Report

Tuesday, 13 November 2007 09:50 (20 minutes)

Status of the R&D on thin planar detectors:

- Design and layout of test structures.
- Procurement and processing of the SOI-FZ test wafers
- Procurement and processing of the EPI wafers
- Simulations
- Irradiation plans

Primary author: MOSER, Hans-Günther (Max-Planck-Institut)

Presenter: MOSER, Hans-Günther (Max-Planck-Institut)

Session Classification: 3D detectors & Simulations & New structures

Track Classification: 3D Detectors and New Structures

Contribution ID: 5

Type: **not specified**

Results with thin and standard p-type detectors after heavy neutron irradiation

Monday, 12 November 2007 11:30 (20 minutes)

Comparison of the charge collection efficiency of 300 μm and 140 μm thick silicon microstrip detectors after neutron irradiation up to $1 \times 10^{16} \text{ cm}^{-2}$.

Primary author: Dr CASSE, Gianluigi (Department of Physics)

Presenter: Dr CASSE, Gianluigi (Department of Physics)

Session Classification: Full detector systems

Track Classification: Full Detector Systems

Contribution ID: 6

Type: **not specified**

Fluence dependent recombination lifetime in neutron and proton irradiated MCz , FZ and epi-Si structures.

Tuesday, 13 November 2007 15:50 (20 minutes)

Fluence dependent recombination lifetime in neutron and proton irradiated MCz , FZ and epi-Si structures.

E.Gaubas, J.Vaitkus, T.Ceponis, A.Uleckas, J.Raisanen, S.Vayrynen, and E.Fretwurst

Results of comparative investigation of recombination lifetime in neutron and proton irradiated MCz, FZ and epi-Si structures are presented. Recombination lifetime in neutron and high energy proton irradiated different materials decreases near linearly with fluence enhancement in the range of $1E12 - 3E16$ $1/cm^2$. However, absolute lifetime values are significantly decreased in low energy (~ 2 MeV) proton irradiated structures relatively to those in neutron and high energy protons irradiated material. Cross-sectional lifetime scans within wafer thickness are presented and discussed.

Primary author: Dr GAUBAS, Eugenijus (Vilnius university)

Co-author: Prof. VAITKUS, Juozas (Vilnius University)

Presenter: Dr GAUBAS, Eugenijus (Vilnius university)

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: 7

Type: **not specified**

Results from the Common RD50 Production with Micron

Monday, 12 November 2007 11:10 (20 minutes)

We will show data on C-V, I-V, Cint, Rint etc. pre-rad and post rad.

But we will concentrate on charge collection with a beta source and compare neutron irradiated sensors up to 2×10^{15} n/cm².

Primary author: SADROZINSKI, Hartmut (Santa Cruz Inst. for Particle Phys. (SCIPP) - Univ. of Californi)

Co-author: SCIPP GROUP, Maureen et al. (SCIPP)

Presenter: SADROZINSKI, Hartmut (Santa Cruz Inst. for Particle Phys. (SCIPP) - Univ. of Californi)

Session Classification: Full detector systems

Track Classification: Full Detector Systems

Contribution ID: 8

Type: **not specified**

Determination of Trapping Time Constants in Neutron Irradiated Thin Epitaxial Pad Detectors

Monday, 12 November 2007 16:50 (20 minutes)

Due to the thickness and therefore very short signal length, the classic analysis techniques (ECC, CCM) failed for the determination of trapping times. We presented a method which allows to extract the trapping time constant without a time resolved signal. The method is a combination of simulation and measurement of the charge collection of an irradiated pad detector.

Primary author: WEBER, Jens (Universität Dortmund)

Presenter: WEBER, Jens (Universität Dortmund)

Session Classification: Pad Detector Characterization & Defect Engineering

Track Classification: Defect Engineering and Pad Detector Characterization

Contribution ID: 9

Type: **not specified**

Annealing induced evolution of defect centres in MCz silicon irradiated with a neutron fluence of $1e16 \text{ cm}^{-2}$

Tuesday, 13 November 2007 15:30 (20 minutes)

High-resolution photoinduced transient spectroscopy (HRPITS) and photoluminescence (PL) measurements have been employed to studying the annealing-induced changes in the defect structure of MCz Si irradiated with the very high fluence of 1-MeV neutrons. The defect centres were studied after three annealing steps: 1h, 80 oC; 1h, 80 oC + 1h, 160 oC and 1h, 80 oC + 1h, 160 oC + 1h, 240 OC. It is found that annealing allows the observation of the self-interstitial related W-line in the PL spectra. This is probably due to the annihilation of non-radiative recombination centres. The defect reaction induced by the annealing lead to the significant increase of the A-centres concentration.

Primary author: Prof. KAMINSKI, Pawel (Institute of Electronic Materials Technology)

Co-authors: Mrs SURMA, Barbara (Institute of Electronic Materials Technology); Dr KOZLOWSKI, Roman (Institute of Electronic Materials Technology)

Presenter: Prof. KAMINSKI, Pawel (Institute of Electronic Materials Technology)

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: 10

Type: **not specified**

Photoconductivity spectra and persistent conductivity in the irradiated Si samples (WODEAN)

Tuesday, 13 November 2007 16:10 (20 minutes)

It is presented the dependence of the photoconductivity spectra in the irradiated by neutrons with fluence $1e14 - 1e16 \text{ cm}^{-2}$. The deep local levels are identified by Lucovsky model, data about traps obtained from thermally stimulated conductivity and the effects of conductivity via impurity (traps) band - from the temperature dependence of persistent conductivity. The results are discussed involving the lifetime, mobility of carriers and induced inhomogeneities dependence on the fluence models.

Primary author: VAITKUS, Juozas (Inst. of Mater. Sci. & Appl. Res. (IMSAR) - Vilnius University)

Co-authors: Mr MEKYS, Algirdas (Vilnius University); Dr STORASTA, Jurgis (Vilnius University); Prof. KAZUKAUSKAS, Vaidotas (Vilnius university); Mr KALENDRA, Vidmantas (Vilnius University)

Presenter: VAITKUS, Juozas (Inst. of Mater. Sci. & Appl. Res. (IMSAR) - Vilnius University)

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: 11

Type: **not specified**

CCE results with FZ and MCz p-type detectors after heavy neutron irradiation

Monday, 12 November 2007 11:50 (20 minutes)

Comparison of the charge collection efficiency as a function of resistivity and annealing times for FZ and MCz p-type silicon microstrip detectors after neutron irradiation up to $3 \times 10^{15} \text{ cm}^{-2}$.

Primary author: Dr AFFOLDER, Anthony (University of Liverpool)

Co-authors: Prof. PHIL, Allport (University of Liverpool); Dr CASSE, Gian Luigi (University of Liverpool)

Presenter: Dr AFFOLDER, Anthony (University of Liverpool)

Session Classification: Full detector systems

Track Classification: Full Detector Systems

Contribution ID: 12

Type: **not specified**

Cluster related hole traps with enhanced-electric-field-emission- the source for long term annealing in hadron irradiated silicon diodes -

Tuesday, 13 November 2007 13:50 (20 minutes)

Cluster related defects were investigated by the Thermally Stimulated Current (TSC) method in neutron irradiated n-type Si diodes during 80C annealing. Three hole traps proved to have an electric-field-enhanced emission characteristic for Coulombic wells. Their zero field emission rates were obtained describing the TSC peaks with the three-dimensional Poole Frenkel formalism when accounting for the spatial distribution of the diodes electric field. As acceptors in the lower half of the gap these centers have a direct impact on the effective doping of the n-type diodes. They are revealed as causing the long-term annealing effects.

Primary author: PINTILIE, Ioana (NIMP Bucharest)

Co-authors: FRETWURST, Eckhart (Hamburg University, Institute for Experimental Physics); LINDSTROEM, Gunnar (Hamburg University, Institute for Experimental Physics)

Presenter: PINTILIE, Ioana (NIMP Bucharest)

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: 13

Type: **not specified**

The WODEAN Project

Tuesday, 13 November 2007 13:30 (20 minutes)

E. Fretwurst for the Wodean collaboration

Universities of Hamburg, Florence, Minsk, Oslo, Vilnius; NIMP Bucharest, CERN-PH, JSI Ljubljana, Kings College London, ITME Warsaw

A short introduction on the WODEAN project will be given. The main object of the project is to combine several methods of defect analysis in a correlated effort for the investigation of radiation induced defects, focusing primarily on trapping. As trapping is largely independent on the detector material and type of hadronic irradiation, it was decided to restrict the experiments on MCz and FZ silicon only. The status after the Vilnius meeting will be reviewed. New results will be presented by members of the collaboration during this workshop.

Primary author: FRETWURST, Eckhart (II. Institut fuer Experimentalphysik)

Presenter: FRETWURST, Eckhart (II. Institut fuer Experimentalphysik)

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: 14

Type: **not specified**

Discussion Session: Defect and Material Characterization

Tuesday, 13 November 2007 16:50 (20 minutes)

Session Classification: Defect and Material Characterization & New Materials

Contribution ID: 15

Type: **not specified**

First results on 24 GeV/c proton irradiated thin silicon detectors

Monday, 12 November 2007 16:10 (20 minutes)

E. Fretwurst (a), L. Andricek (b), G. Lindström (a), H.G. Moser (b), I. Pintilie (a,c), R. Richter (b), R. Röder (d)

(a) University of Hamburg, (b) MPI-Semiconductor Laboratory Munich, (c) NIMP Bucharest, (d) CiS Institute for Microsensoric Erfurt

Preliminary results on 24 GeV/c proton irradiated thin n-type FZ (50 μm , 100 μm), MCz (100 μm), epitaxial (72, 100, 150 μm , standard and oxygenated) pad detectors will be presented and compared with results from neutron damage.

Primary author: FRETWURST, Eckhart

Presenter: FRETWURST, Eckhart

Session Classification: Pad Detector Characterization & Defect Engineering

Contribution ID: 16

Type: **not specified**

SPICE model of irradiation detectors

Tuesday, 13 November 2007 09:30 (20 minutes)

Li Long and Ralf Röder
CiS Institut of Micro Senors GmbH
99099 Erfurt, Germany

Abstract

After three decades persistent investigation and development, semiconductor irradiation detector has continuously improved its performance and extended its application. A huge amount of researches regarding radiation hardness, detection efficiency, position and time resolution, and noise has been made. The semiconductor irradiation detector has reached a high level in both performance and diversity. Mean while, readout system for tracking and imaging has also been developed parallely. Therefore we attempt to develop a SPICE model for irradiation detectors, which consists all effects of material properties, irradiation and annealing history and geometry. To acquire the parameter for the SPICE model we designed a lot of sensors with different geometry parameters and manufactured with different technology on different silicon materials. The parameters related with the radiation hardness are mainly from the outputs of RD50. A windows program PRODID is developed to generate the SPICE model library. This model can be used by system designer for the simulation of irradiation and maintenance scenario, for the plan of detection system, and the optimized integration of sensors and readout. For the sensor developer it can be used in the technology design and performance simulation.

Presenter: LONG, Li (CIS, Erfurt, Germany)

Session Classification: 3D detectors & Simulations & New structures

Contribution ID: 17

Type: **not specified**

Freiburg status report on 3D detectors

Tuesday, 13 November 2007 10:40 (20 minutes)

A summary will be given on recent Freiburg activities with emphasis on tests of 3D STC detectors. We have tested a module with two Trento-made 3Ds, irradiated up to 10^{15} Neq.

Primary author: PAHN, Gregor (Fakultät für Physik - Albert-Ludwigs-Universität Freiburg)

Presenter: PAHN, Gregor (Fakultät für Physik - Albert-Ludwigs-Universität Freiburg)

Session Classification: 3D detectors & Simulations & New structures

Track Classification: 3D Detectors and New Structures

Contribution ID: 18

Type: **not specified**

Annealing studies on defects after neutron irradiation in different silicon material

Tuesday, 13 November 2007 14:10 (20 minutes)

Isothermal annealing studies at 60° C and 300° C were performed on thin FZ, MCz and EPI-DO n-type silicon diodes after irradiation with reactor neutrons. Deep level transient spectroscopy (DLTS) was used to follow the evolution of defect levels while C/V and I/V characteristics were taken to determine the electrical properties (depletion voltage and leakage current) of the detectors. A possible correlation between the evolution of cluster related DLTS-signals and the current annealing was studied. Further results obtained by DLTS-measurements concerning the annealing behaviour of defect levels in the different materials will be presented and discussed.

Primary author: Ms JUNKES, Alexandra (Institute for Experimental Physics, University of Hamburg)

Co-authors: Dr FRETWURST, Eckhart (Institute for Experimental Physics, University of Hamburg); Prof. LINDSTRÖM, Gunnar (Institute for Experimental Physics, University of Hamburg); Dr PINTILIE, Ioana (Institute for Experimental Physics, University of Hamburg; NIMP, Bucharest-Magurele)

Presenter: Ms JUNKES, Alexandra (Institute for Experimental Physics, University of Hamburg)

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: **19**

Type: **not specified**

Discussion session

Monday, 12 November 2007 17:30 (30 minutes)

Session Classification: Pad Detector Characterization & Defect Engineering

Contribution ID: 20

Type: **not specified**

INTERPRETATION OF DLTS DATA FOR SILICON DETECTORS IRRADIATED WITH NEUTRONS

Tuesday, 13 November 2007 14:30 (30 minutes)

It is expected the formation of defect clusters when high-energy Si knock-on atoms are created and cluster effects are likely to be quite important for radiation damage of silicon detectors in LHC experiments. However the understanding of these effects in Si detectors irradiated with different particles is insufficient as compared to the knowledge on the role of isolated point defects.

DLTS is one of the main methods of defect characterization in semiconductor structures. At present two characteristic features of clustered defects are well established. First, it is temperature dependence of DLTS peak amplitude $S_{max}(T)$ and closely related to this feature the inequivalent heights of divacancy peaks [1-4]. And second, the stretched kinetics for filling of clustered traps [4, 5].

This work focuses on studies of the first effect. Numerical simulation of cluster effect on DLTS signal has been performed. The results of this simulation have been applied to interpret DLTS data obtained for different detectors irradiated with neutrons.

It has been found that in detectors made on MCZ silicon not only divacancies but also vacancy-oxygen complex are distributed in clustered form.

Results of our studies of bistable defects in irradiated and annealed silicon detectors are also presented.

1. I.V. Antonova, A.V. Vasiliev, V.I. Panov and S.S. Shaimeev, Phys. Tekhn. Poluprovodn. 22, 998 (1988).
2. I.V. Antonova and S.S. Shaimeev, Phys. Tekhn. Poluprovodn. 25, 847 (1991).
3. M. Kuhnke Microscopic and Electrical Properties of Clustered Divacancies in n-Type Silicon ROSE/TN/2003-01.
4. E. V. Monakhov, J. Wong-Leung, A. Yu Kuznetsov, C. Jagadish, and B. G. Svensson, Phys. Rev. B 65, 245201 2002.
5. R. M. Fleming, C. H. Seager, D. V. Lang, P. J. Cooper, E. Bielejec, and J. M. Campbell J. Appl. Phys., 102, 043711 2007.

Primary author: Dr MAKARENKO, Leonid (Belarusian State University)

Presenter: Dr MAKARENKO, Leonid (Belarusian State University)

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: 21

Type: **not specified**

CCE measurement with irradiated micro-strips (S.M.A.R.T. samples)

Monday, 12 November 2007 14:10 (20 minutes)

Preliminary measurement of CCE on Fz, MCz and Epitaxial micro-strip sensors equipped with CMS F.E. read-out fast electronics.

Primary author: Dr MESSINEO, Alberto (Univ. + INFN)

Presenter: Dr MESSINEO, Alberto (Univ. + INFN)

Session Classification: Full detector systems

Track Classification: Full Detector Systems

Contribution ID: 22

Type: **not specified**

Silicon beam telescope for CMS SLHC detector studies (SiBT)

Monday, 12 November 2007 13:30 (20 minutes)

The silicon strip detector based beam telescope, the SiBT, was upgraded in spring 2007 using DAQ components from the CMS Tracker module testing and Fermilab D0 RunIIIb silicon strip sensors from Hamamatsu. The interpolated position resolution of the telescope is 9 μm , it has a S/N of 25 and an active area of 4 x 4 cm². The telescope contains 8 reference detector planes in ± 45 degree orientation and has two slots in the middle of the telescope for the devices to be tested. The telescope can be cooled down to -20°C temperature. In June and August 2007 the telescope was used for studying full-size AC-coupled strip detectors made of n-type magnetic Czochralski silicon.

Primary author: LUUKKA, Panja-Riina (Helsinki Institute of Physics HIP)

Presenter: LUUKKA, Panja-Riina (Helsinki Institute of Physics HIP)

Session Classification: Full detector systems

Track Classification: Full Detector Systems

Contribution ID: 23

Type: **not specified**

ATLAS - SLHC upgrade activities

Monday, 12 November 2007 09:15 (30 minutes)

Presenter: SADROZINSKI, Hartmut (Santa Cruz Inst. for Particle Phys. (SCIPP) - Univ. of California)

Session Classification: Towards the Super-LHC (Experiments)

Track Classification: Towards the SLHC (invited overview talks)

Contribution ID: 24

Type: **not specified**

CMS - SLHC Upgrade activities

Monday, 12 November 2007 09:45 (30 minutes)

Presenter: MANNELLI, Marcello (CERN)

Session Classification: Towards the Super-LHC (Experiments)

Contribution ID: 25

Type: **not specified**

Accelerator Upgrades for SLHC

Tuesday, 13 November 2007 09:00 (30 minutes)

Presenter: BRUNING, Oliver (CERN)

Session Classification: Towards the SLHC (Accelerators)

Contribution ID: 26

Type: **not specified**

Discussion session on Full Detector Systems

Monday, 12 November 2007 14:50 (30 minutes)

Session Classification: Full detector systems

Contribution ID: 27

Type: **not specified**

Discussion session on 3D detectors and New structures

Tuesday, 13 November 2007 11:20 (30 minutes)

Session Classification: 3D detectors & Simulations & New structures

Contribution ID: 28

Type: **not specified**

Characteristics of InP Particle Detectors Structures

Tuesday, 13 November 2007 16:30 (20 minutes)

N-type SI InP material [100] doped with Fe (deep acceptor) was initial substrate for preparation of detectors structures.

P-N junction structures were produced by liquid phase epitaxy technique with Zn and Mg.

Electrical and detection parameters of structures were measured and compared.

Primary author: Prof. SOPKO, Bruno (Czech Technical University (CTU))

Co-authors: Mr CHREN, Dominik (Department of Physics, Faculty of Mechanical Engineering); Dr NOHAVICA, Dusan (Institute of Photonics and Electronics of the ASCR); Ms KOZAK, Halina (Institute of Photonics and Electronics of the ASCR); Dr ZDANSKY, Karel (Institute of Photonics and Electronics of the ASCR); Dr SOLAR, Michael (Department of Physics, Faculty of Mechanical Engineering); Dr POSPISIL, Stanislav (Institute of Applied and Experimental Physics IAEP); Mr HORIZDOVSKY, Tomas (Department of Physics, Faculty of Mechanical Engineering); Dr SOPKO, Vit (Department of Physics, Faculty of Mechanical Engineering); Dr KOHOUT, Zdenek (Department of Physics, Faculty of Mechanical Engineering)

Presenter: Prof. SOPKO, Bruno (Czech Technical University (CTU))

Session Classification: Defect and Material Characterization & New Materials

Track Classification: Defect and Material Characterization

Contribution ID: 29

Type: **not specified**

TCT and CCE measurements for 9 MeV and 24 GeV/c irradiated n-type MCz-Si pad detectors

Monday, 12 November 2007 15:50 (20 minutes)

N-type MCz-Si pad detectors have been irradiated by 9 MeV and 24 GeV/c protons up to 1×10^{16} $n_{\text{eff}}/\text{cm}^2$ fluence. The samples have been characterized by Transient Current Technique (TCT) operating with 670nm laser and Charge Collection Efficiency (CCE) measurements performed by 1060nm IR laser. Low and high energy proton irradiation results are compared and charge collection of MCz-Si detectors is discussed.

Primary author: Dr HAERKOENEN, Jaakko (Helsinki Institute of Physics HIP)

Co-authors: Dr TUOMINEN, Eija (Helsinki Institute of Physics HIP); Mr TUOVINEN, Esa (Helsinki Institute of Physics HIP); Dr LUUKKA, Panja (Helsinki Institute of Physics HIP); Dr CZELLAR, Sandor (Helsinki Institute of Physics HIP)

Presenter: Dr HAERKOENEN, Jaakko (Helsinki Institute of Physics HIP)

Session Classification: Pad Detector Characterization & Defect Engineering

Track Classification: Defect Engineering and Pad Detector Characterization

Contribution ID: 30

Type: **not specified**

LHCb Upgrade Activities

Monday, 12 November 2007 10:45 (25 minutes)

The plans for the upgrade of the LHCb experiment will be presented.

The LHCb experiment plans to upgrade from its nominal instantaneous luminosity of $2 \times 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$ to around a factor of ten higher. The key elements of the upgrade will be a displaced vertex trigger at the initial level of triggering and a radiation hard vertex detector.

An overview of the changes required to the full experiment will be presented, concentrating particularly on the requirements for the replacement vertex detector. A particle fluence in excess of $10^{15} \text{ 1 MeV neutron equivalents / cm}^2$ is anticipated for the inner active strips or pixels of the upgraded vertex detector.

Primary authors: PARKES, Chris (Department of Physics and Astronomy); EKLUND, Lars (Department of Physics and Astronomy)

Presenter: EKLUND, Lars (Department of Physics and Astronomy)

Session Classification: Towards the Super-LHC (Experiments)

Track Classification: Towards the SLHC (invited overview talks)

Contribution ID: 31

Type: **not specified**

LHCb DAQ for strip detectors

Monday, 12 November 2007 14:30 (20 minutes)

We present details of a readout system for strip detectors, using LHCb Beetle chips and TELL1 DAQ. The front-end chip takes analogue samples from each strip at 40MHz. External triggering and time measurement are required to select hits on the sensors.

The system has very recently been used at the ATLAS 3D testbeam, with 3D-STC strips (produced by Trento, tested by Freiburg) and with n-on-p strips using FZ and MCz substrates.

Primary author: Dr EKLUND, Lars (University of Glasgow)

Co-author: Mr PENNICARD, David (University of Glasgow)

Presenter: Dr EKLUND, Lars (University of Glasgow)

Session Classification: Full detector systems

Track Classification: Full Detector Systems

Contribution ID: 32

Type: **not specified**

Charge collection simulation of 3D detectors with SLHC radiation damage

Tuesday, 13 November 2007 11:00 (20 minutes)

We present simulations of radiation-damaged 3D detectors, showing how electrode spacing and different device structures affect depletion and charge collection behaviour at 10^{16} neq/cm² damage. The simulation results are compared with existing measurements on planar and 3D sensors.

Primary author: Mr PENNICARD, David (University of Glasgow)

Co-authors: Dr FLETA, Celeste (University of Glasgow); Dr BATES, Richard (University of Glasgow)

Presenter: Mr PENNICARD, David (University of Glasgow)

Session Classification: 3D detectors & Simulations & New structures

Track Classification: 3D Detectors and New Structures

Contribution ID: 33

Type: **not specified**

Results of a beamtest with irradiated M-Cz sensors

Monday, 12 November 2007 13:50 (20 minutes)

In a beamtest at CERN H2 the behaviour of irradiated and non-irradiated full-size AC-coupled strip detectors made of n-type magnetic Czochralski silicon was investigated. The sensors of the size of $4 \times 4 \text{ cm}^2$, $300 \mu\text{m}$ thickness with 768 strips and $50 \mu\text{m}$ pitch had been produced at the Helsinki Institute of Physics. After the qualification, the sensors were irradiated with fluences between $10^{14}/\text{cm}^2$ and $10^{15}/\text{cm}^2$ and were tested again. Modules had been built with irradiated and non-irradiated sensors and APV electronics. The sensors' performances concerning mainly signal/noise, efficiency and resolution were tested with the help of the silicon strip detector based beam telescope SiBT. The beamtest and the results will be presented.

Primary author: FREY, Martin (Institut fuer Experimentelle Kernphysik)

Presenter: FREY, Martin (Institut fuer Experimentelle Kernphysik)

Session Classification: Full detector systems

Track Classification: Full Detector Systems

Contribution ID: 34

Type: **not specified**

First results on electric field distribution in irradiated epi-Si detectors

Monday, 12 November 2007 17:10 (20 minutes)

Primary author: Dr VERBITSKAYA, Elena (Ioffe Physico-Technical Institute RAS)

Presenter: Dr VERBITSKAYA, Elena (Ioffe Physico-Technical Institute RAS)

Session Classification: Pad Detector Characterization & Defect Engineering