Nordic Detector Technology Course,
Laboratory exercises 7-11.1.2013, Helsinki Institute of Physics/Detector Laboratory

Venue: Physicum, University of Helsinki, Gustaf Hällströmin katu 2a, 00560 Helsinki
Webpage: https://indico.nbi.ku.dk/conferenceDisplay.py?confId=454

Objective:

Laboratory exercises will provide the students with hands-on training in detector technologies, used in high-energy physics experiments. The work will include semiconductor detectors, gas detectors, and read-out systems.

Tasks:

Participating students (19) will be divided in five groups of four persons. Each group will perform two tasks:

A) Construction and measurement of gas-filled wire-chamber detector, 3-4 days
Students construct own particle detector using traditional gas-filled wire chamber technology. Everyday materials such as copper tube and aluminum wire are used in the work. In addition, the detector and appropriate read out electronics are used to measure radiation. The groups will work simultaneously with Task A, each group with own wire-chamber detector. Instructors are available for questions all the time.
Instructors: Dr. Francisco Garcia, Jouni Heino, Timo Hildén, Rauno Lauhakangas, Alexander Winkler / UH
Laboratory: B307

B) Silicon detector response to irradiation, ½-1 day
Students use silicon detectors to measure detector response to radiation source. The detector is connected to read-out chip. The chain of data acquisition contains preamplifier, linear amplifier, multi channel analyzer and oscilloscope. Two groups will perform Task B together.
Instructor: Prof. Richard Brenner, University of Uppsala, Sweden.
Laboratory: B304

Reports:

Each group will write a report about both tasks. During the week, office space is available for group work. The final deadline for the reports is Friday January 25th. The reports must be sent to Richard.Brenner@cern.ch (TASK A) and Timo.Hilden@helsinki.fi (TASK B). After having lab reports recognized, students will be assigned 5 ECTS.

Timetable:

Aneliya Karadzhinova will pick up students from hotel on Monday at 8:30. It is recommended to use tram no 8 from the hotel to the course venue.

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-12:00	Introduction to course	Gas-det: all	Gas-det: all	Gas-det: all	Gas-det: all
12:00-13:00	Lunch	Lunch	Lunch	Lunch	Lunch
13:00-17:00	Si-det: groups 1&2 Gas-det: others	Si-det: groups 3&4 Gas-det: others	Si-det: group 5 Gas-det: others	Gas-det: all	Closure
18:00-21:00			Dinner at Rest. Zetor Mannerheimintie 3		

Introduction @ Monday 9 am:

Welcome:	Doc. Eija Tuominen
Safety in the Laboratory:	Lab.Eng. Jouni Heino
Principle of proportional counters:	M.Sc. Timo Hilden
Mechanics of proportional counters:	Lab.Tech. Raimo Turpeinen
How to build proportional counters:	Lab.Eng. Rauno Lauhakangas

List of Participants:

no	Name	Institution	Studies	E-mail	City	Country
1	Anders Floderus	Lund University	PhD	anders.floderus@hep.lu.se	Lund	Sweden
2	Aneliya Karadzhinova	University of Helsinki	PhD	aneliya.karadzhinova@cern.ch	Helsinki	Finland
3	Anthony Hawkins	Lund University	PhD	anthony.hawkins@cern.ch	Lund	Sweden
4	Ask Emil Løvschall-Jensen	Niels Bohr Institute	PhD	ask.emil.jensen@cern.ch	Copenhagen	Denmark
5	Emma Kuwertz	KTH	PhD	emma.sian.kuwertz@cern.ch	Stockholm	Sweden
6	Erik Brücken	University of Helsinki	PhD	brucken@cc.helsinki.fi	Helsinki	Finland
7	Francesco Devoto	University of Helsinki	PhD	francesco.devoto@helsinki.fi	Helsinki	Finland
8	Giacomo Fedi	University of Helsinki	PhD	giacomo.fedi@helsinki.fi	Helsinki	Finland
9	Gorm Galster	Niels Bohr Institute / CERN	PhD	gorm.galster@cern.ch	Copenhagen	Denmark
10	Henric Taavola	Uppsala University	PhD	henric.taavola@physics.uu.se	Uppsala	Sweden
11	Jelena Jovicevic	Royal Institute of Technology	PhD	Jelena.Jovicevic@cern.ch	Stockholm	Sweden
12	Julia Rieger	St. George-August University	M.Sc.	Julia.Rieger@cern.ch	Gottingen	Germany
13	Lene Bryngemark	Lund University	PhD	lene.bryngemark@hep.lu.se	Lund	Sweden
14	Maria Hoffman	HEP	M.Sc.	maria.hoffmann@cern.ch	Copenhagen	Denmark
15	Martin Ljunggren	Lund University	PhD	martin.ljunggren@hep.lu.se	Lund	Sweden
16	Oleksandr Viazlo	Lund University	PhD	oleksandr.viazlo@cern.ch	Lund	Sweden
17	Sune Jakobsen	Niels Bohr Institute / CERN	PhD	Sune.Jakobsen@cern.ch	Copenhagen	Denmark
18	Terhi Järvinen	University of Helsinki	M.Sc.	terhi.jarvinen@helsinki.fi	Helsinki	Finland
19	Tuva Richert	Lund University	PhD	tuva.ora.herenui.richert@cern.ch	Lund	Sweden

Helsinki personnel:

Prof. Paula Eerola, course supervisor
Doc. Eija Tuominen, course coordinator
M.Sc. Aneliya Karadzhinova, course logistics
Prof. Richard Brenner, silicon detector technologies (richard.brenner@cern.ch)
Doc. Ivan Kassamakov, silicon detector technologies
Dr. Francisco Garcia, gas detector technologies
Lab.Eng. Jouni Heino, gas detector technologies
Lab.Eng. Rauno Lauhakangas, gas detector technologies
M.Sc. Timo Hilden, gas detector technologies
M.Sc. Alexander Winkler, gas detector technologies
Lab.Tech. Raimo Turpeinen, mechanical works
(name.surname@helsinki.fi)