

# **Minutes of the 63<sup>rd</sup> Meeting of the PRC DESY May 10<sup>th</sup> and 11<sup>th</sup> 2007**

## **PRC members present:**

J. Brau (Oregon), P. Buchholz (Siegen), R. Forty (CERN), U. Gensch (DESY), R.-D. Heuer (DESY/U Hamburg), W. Hollik (MPI Munich), Y.K. Kim (Chicago), J. Kühn (Karlsruhe), T. Lohse (HU Berlin), R. Milner (MIT), G. Quast (Karlsruhe), J. Timmermans (NIKHEF), D. Trines (DESY), S. Riemann (DESY, scientific secretary), D. Pitzl (DESY, HERA experiment coordinator)

G. Anton and N. Saito (Kyoto U) attended the meeting via phone.

A. Wagner (DESY) could not attend the meeting.

## **Non PRC members attending closed session items:**

HERA: M. Bieler (DESY), B. Holzer (DESY), A. Kling (DESY), M. Vogt (DESY)  
Pol2000: T. Behnke (DESY), N. Coppola (DESY), R. Fabbri (NIKHEF), Z. Zhang (Orsay)

Representatives from the Experiments:

H1: O. Behnke (U Heidelberg), C. Diaconu (Marseille), G. Eckerlin (DESY),  
D. Pitzl (DESY), Perez (Saclay), C. Vallee (Marseille), J. Bracinik(MPI  
Munich), M. Wessels (DESY)  
ZEUS: H. Abramowicz (TAU and DESY), E. Gallo (INFN Firenze), A. Polini (INFN  
Bologna), U. Schneekloth (DESY), Y. Yamazaki (KEK)  
HERMES: A. Fantoni (INFN Frascati), J. Stewart (DESY), N. Makins (U Illinois)  
LHC: M. Gasthuber (DESY), J. Mnich (DESY), M. Medinnes (DESY), K. Mönig  
(DESY), P. Wegener (DESY),  
ALPS A. Lindner (DESY), N. Meyer (DESY), D. Notz (DESY), A. Ringwald (DESY)

ILC R&D:

DEPFET: L. Andricek (Mannheim U), P. Fischer (Mannheim U), P. Kodys (Charls U  
Prague), H. Moser (MPI Munich), R. Richter (MPI Munich), J. Velthuis (Bonn  
U), N. Wermes (Bonn U)

LCFI-CCD: T. Greenshaw (U Liverpool), S. Worm (RAL)

MAPS: M Winter (IPHC/CNR Strasbourg)

External Referee: K-T. Knöpfle (MPI Heidelberg)

## **The PRC reviewed the following documents:**

Update Reports from existing R&D projects:

**PRC R&D 03/01 Update 02(07)**

**PRC R&D 01/01 Update 03(07)**

**PRC R&D 01/04 Update 03(07)**

Document sent to the PRC in January 2007:

**PRC 07/01** Production and Detection of Axion-like Particles in a HERA Dipole Magnet

## Agenda

### Open session: May 10<sup>th</sup> 2006, Main Auditorium

HERA	A. Kling (DESY)
POL2000	N. Coppola (DESY)
ZEUS	A. Polini (INFN Bologna)
H1	M. Wessels (DESY)
HERMES	J. Stewart (DESY)
ALPS	N. Meyer (DESY)
LHC	J. Mnich (DESY)
R&D at the ILC:	
DEPFET	H.-G. Moser (MPI Munich)
LCFI-CCD	S. Worm (RAL)
MAPS	M. Winter (Strasbourg)

### Closed Sessions: May 10<sup>th</sup> and 11<sup>th</sup>, Seminar room 7a

Item 1: Minutes and matters arising since last meeting

Item 2: News from the Laboratory

Item 3: Review of HERA

- 3.1. HERA Running
- 3.2. Review of POL2000
- 3.3. Review of HERA Experiments
  - 3. 3.1. Review of H1
  - 3. 3.2. Review of ZEUS
  - 3. 3.3. Review of HERMES

Item 4: ILC Detector R&D

- 4.1. Review of DEPFET
- 4.2. Review of LCFI-CCD
- 4.3. Review of MAPS

Item 5: Review of LHC experiments

Item 6: Review of ALPS

Item 7: AOB

### Item 1: Approval of the minutes and matters arising from the last meeting

The PRC would like to thank G. Anton, P. Buchholz, W. Hollik, J. Kühn, and R. Milner for agreeing to continue their PRC membership for another two years, and J. Brau for agreeing to continue until end of 2007.

The minutes of the 62<sup>nd</sup> DESY PRC meeting were accepted with minor changes.

In February 2007 a PRC phone conference was held to review the decision about running HERA at low proton energies. The experiments H1 and ZEUS supported the physics relevance of switching to low energies; HERA was well prepared by machine studies. In case the luminosity is below the expectations or other complications occur, H1 prefers to return immediately to high energies to gain luminosity for new physics searches. The PRC recommended to proceed as planned, to switch to low proton energies with the option of a return to high energies in case of serious inefficiencies.

In January 2007 the Letter of Intent for the ALPS experiment (PRC 01/07) was sent to the PRC for evaluation. J. Kühn and G. Quast agreed to review the proposal; G. Raffelt was asked to provide an expert opinion. In the phone conference in February 2007 the PRC recommended to support the ALPS experiment.

## **Item 2: News from the Laboratory**

R. Heuer presented the news from the laboratory.

The HERA II running period at high energies was closed in March 2007 and HERA was switched successfully to running at low proton energies. On June 30, 2007 HERA will be switched off. The 15 years of efficient data taking will be celebrated with a ‘HERA Fest’. In February 2007, at the 9<sup>th</sup> ACFA ILC Physics and Detector Workshop & ILC GDE Meeting in Beijing the ILC Reference Design Report (RDR) was published. It contains the baseline design for the ILC and a cost estimate of about 5.5 billion Euro. This estimate exceeds the costs expected for the TESLA Project in 2001. The main reasons are inflation, raising commodity prices, and change of exchange rates; other causes are under study.

End of May a Symposium and Colloquium in honour of Peter Zerwas, leading scientist at DESY, will be held at DESY. Beginning of June the LCWS 2007 and ILC2007 will take place at DESY Hamburg, about 600 participants working for ILC detectors, physics and the machine are expected.

The official starting signal for the XFEL is planned for June 5<sup>th</sup>. The German part of funding is secured by the BMBF budget for specific scientific large-scale equipment in basic science; models for funding its operation are under consideration. Beginning of June the rebuilding of PETRA-III will start.

The Helmholtz Association of German Research Centers initiated the new Project “Helmholtz Alliance – Physics at the Terascale” granting 25 million Euros for the next five years. In this Alliance, the Helmholtz research centers DESY and Karlsruhe, together with 17 universities and the Max Planck Institute for Physics in Munich, will jointly advance German particle physics and technological developments at particle accelerators like the LHC and the planned ILC.

**The PRC congratulates the laboratory for a number of achievements reported by Rolf Heuer. These include the successful running for HERA and its three experiments, a smooth and efficient transition to the HERA low-energy running, and the DESY groups' significant contributions to the ALTAS and CMS experiments. The PRC is extremely impressed with the Helmholtz Alliance proposal and the recommendations by the review committee. The proposal provides valuable additional strength to the laboratory and is**

**well matched to DESY's scientific programs and demonstrates the strong leadership of DESY for the German particle-physics community. The PRC congratulates the laboratory for this initiative and its strong leadership in the community.**

### **Item 2.1: Mid-term Evaluation of the Helmholtz Senate recommendations**

The PRC discussed the recommendations of the mid-term evaluation by the Helmholtz Senate in the closed session.

**During the 63<sup>rd</sup> PRC meeting, the PRC has evaluated the Helmholtz Senate recommendations relevant to DESY's particle and astrophysics programs, and the report has been submitted for the Extended Scientific Committee meeting on May 21-23, 2007.**

## **Item 3: Review of HERA**

### **Item 3.1: HERA Machine**

The HERA II running period at high energies was closed with successful e<sup>+</sup>p running from July 2006 till March 2007, 180 pb<sup>-1</sup> were delivered at an operating efficiency of about 60%. At high proton intensities (117mA) and with positron intensities up to 43 mA stable operation was achieved. Operating at mirror tunes the polarization was 30-40%. The improvements were due to reduced proton beam emittance growth and reduced backgrounds based on fast positron orbit feedback. In March 2007 HERA was switched to a running at low proton energies. Due to the solid preparation the startup phase was smooth and steady luminosity production was achieved already in the first two weeks of running. An average polarization of 50% was obtained. The luminosity production was ahead of schedule at the time of the PRC meeting.

**The PRC is greatly impressed by the excellent performance of the HERA team in the remarkable high-energy running and the rapid transition to low energy in late March followed by a rapid start-up of HERA operations. The HERA team's continuing dedication should be acknowledged. The PRC notes that HERA II delivered the total luminosity of 0.6 fb<sup>-1</sup> at high energy and that if HERA II had continued to run at high energy, the projected luminosity by the end of June would have been around 0.7 fb<sup>-1</sup>. About 10 pb<sup>-1</sup> has already been delivered at the low energy. The PRC notes that the decision about a possible third energy selected for running is expected to be made one week after the 63<sup>rd</sup> PRC meeting. The PRC supports that, if necessary, the polarization group takes up to a few days of beam time to understand the discrepancy in the polarization measurement to achieve a significant improvement on the systematic uncertainty.**

### **Item 3.2: Beam Polarization**

T. Behnke summarized in a short presentation the status of POL2000. The ratio of LPOL/TPOL measurements is now stable but one previous disagreement is not yet understood. The efforts to analyze the measurements with TPOL and LPOL are ongoing. The analysis procedure for the LPOL has remained unchanged since many years; the systematic uncertainty

is below  $\pm 2\%$ . An improved determination of the analyzing power of the LPOL is in progress and the re-evaluation of the systematic uncertainty is under way. Since the last PRC meeting the cavity has been operated longer and more frequently, the hardware worked without problems. Systematic studies for measurements with the cavity have to be finalized.

A preliminary error for polarization measurements will be ready in summer 2007, depending on the manpower a final error will be known in early 2008.

POL2000 was reviewed by P. Buchholz and R. Milner. Both, LPOL and TPOL were operated routinely with high efficiencies: TPOL: 93.06%, LPOL: 79.41%, combined: 99.59 %. The lower efficiency for LPOL was mainly due to cavity running. The difference between some LPOL and TPOL measurements has been understood: during summer shutdown in 2006 an inverted mirror in the optical beam delivery system of the LPOL was found. The disagreement between LPOL and TPOL in August 2005 is not yet understood. The systematic errors for the polarisation measurements with LPOL and TPOL are not yet ready but will be needed by the experiments. The data taken with the cavity could be crucial here. Measurements with TPOL and cavity are in agreement.

The PRC continued the discussion in the closed session.

**The PRC acknowledges the dedication of the small group successfully running the polarimeters and analyzing the data, as well as the support by the experiments. High priority should be given to the determination of the final precision. To achieve this, the cavity measurements may play a decisive role and such measurements should be made as often as possible. The PRC recommends that while still running, sufficient time should be assigned to the cavity measurements for systematic studies. Also up to a few days of beam time should be given to the polarization group if it is necessary to understand the discrepancies up to  $\sim 10\%$  between TPOL and LPOL measurements, resulting in a  $\sim 5\%$  polarization measurement. The PRC urges the polarization group to make a detailed plan of their beam-time needs and to communicate with the machine group and the HERA experiments. The PRC is concerned that the analysis effort still lacks personnel resources for a timely conclusion of the final uncertainties.**

### **Item 3.3: HERA Experiments**

#### **Item 3.3.1: Review of H1**

HERA and H1 had a successful running up to the end of the running with high proton energy; almost  $0.5 \text{ fb}^{-1}$  were recorded. After the efficient start of the low energy run almost  $9 \text{ pb}^{-1}$  were recorded until the PRC meeting. A new fast data reprocessing scheme has been established with “stripped raw data” files on disk. A well aligned pre-processed full HERAII data sample is expected to be available for final analysis soon. A new MC production group was set up to exploit the full potential of Grid for the huge MC samples.

There was no presentation from the H1 collaboration in the closed session.

T. Lohse presented the referee’s report for P. Buchholz and himself. A new group from Bucharest joined the Collaboration and increases expertise and manpower in Grid-computing.

It is necessary that postdocs (e.g. DESY fellows) continue to work dedicatedly for the analysis of HERA data during the next years. There is a large flow of new physics results, 4 papers were already published in 2007 until the PRC meeting, 16 papers were sent to DIS2007. The exclusive HERA I analysis comes to an end, HERA II results start to dominate the conferences. The combination of H1 and ZEUS results is in progress, 4 abstracts were submitted to EPS 2007.

### **Item 3.3.2: Review of ZEUS**

E. Gallo presented an overview of the status of ZEUS. HERA continued the excellent performance up to the end of the high energy run; about  $0.8 \text{ pb}^{-1}$  per day were delivered. In total  $0.5 \text{ fb}^{-1}$  events from HERA I and II were recorded on tape for physics analyses. The run with low proton energy started very fast and smoothly;  $250\text{-}300 \text{ nb}^{-1}$  per day have been delivered. The efficiency of data taking is similar to that at high energies; the detector is in good shape. The collaboration is stable and two new institutes (University of Kiev and Panjab University) joined. A reasonable number of analyses are in progress and all physics groups are well covered to perform high priority analyses. In 2007 5 papers were published until the PRC meeting, 4 were almost finalized. 53 abstracts were submitted to the EPS07 conference, among them 19 with HERA II results. After the successful cooperation of H1 and ZEUS four abstracts were submitted to EPS07 with combined results on neutral current cross sections, isolated leptons, multileptons and  $\alpha_s$  measurement.

The collaboration prepared a strategy document on computing for future analyses. The regular analysis on the Grid will start in 2007; a reprocessing of data is foreseen for 2008. All data and analysis tools will be stored to allow analyses for the next 10 years.

A detailed plan for the dismantling procedure of the ZEUS detector has been prepared.

G. Quast presented the referees report for Y.K. Kim and himself. Already 8% of the originally planned  $10 \text{ pb}^{-1}$  of data taken at lower proton energies are recorded. The prospects for a  $F_L$  measurement are very promising; the photoproduction background is under control. ZEUS is on the way to efficiently use Grid resources for both MC production and user analyses. The common root-based format will allow a long-term analyzability of ZEUS data.

The PRC continued the discussion on in the closed session.

**The PRC congratulates both the H1 and ZEUS collaborations for high-efficiency data taking, for the successful efforts in making optimal use of the remaining HERA running, and for the continuous flow of high quality results. Each experiment collected  $0.5 \text{ fb}^{-1}$  on tape at the end of HERA high-energy running. Both experiments had a very smooth and efficient start-up of the low-energy operations and already accumulated about  $8 \text{ pb}^{-1}$  of the originally planned  $10 \text{ pb}^{-1}$  on tape. The PRC appreciates H1 and ZEUS combined analyses and is pleased with progress made in computing. The computing resources are well planned and both experiments are on the way to efficient use of GRID resources for both Monte Carlo data production and user analyses. The PRC is also pleased with the collaborations' effort to maintain high efficiency for data analyses after the HERA running is over. The PRC recommends the laboratory continue the high level of support of the collaborations to guarantee excellent physics results and publications in the coming**

**years. Although the physicist resources to complete important physics analyses appear to be sufficient, the PRC notes that this picture could change when the LHC turns on. The PRC, therefore, recommends that the experiments and the laboratory pay special attention to the physicist resources issue and make efforts to attract students.**

### **Item 3.3.3: Review of HERMES**

The HERMES experiment is running well; good progress has been made on understanding the recoil detector. The data taken with nuclear targets are the world best data on semi-inclusive DIS from nuclei and are invaluable for understanding the hadronization process in nuclei. First results from final data set taken with transverse polarized target are available.

N. Makins presented an overview on ongoing and planned analysis activities of the HERMES collaboration with focus on priorities and manpower. The measurement of  $\Delta q$  is unique at HERMES and fully covered with Run1 data. The measurements of fragmentation functions deliver the world's largest DIS database with outstanding particle identification. The measurement of particle density functions from unpolarized semi-inclusive DIS can only be performed at HERMES. The transverse polarized hydrogen target provides absolutely unique results with access to new physics. With the recoil detector measurements of deep virtual Compton scattering (DVCS) are performed with true exclusivity. These data are complementary to measurements at JLab and prioritized by the collaboration.

R. Milner presented the referee's report for N. Saito and himself. HERMES had an efficient data taking; about 47 million DIS events with hydrogen target and about 10 million DIS with deuteron target were recorded. The beam polarization reached 50% with the low energy proton beam. The recoil detector is now operated routinely and the full DVCS data sample is expected as proposed. A steady stream of high quality physics results, in particular on hadronization of quarks, transverse spin structure and polarization of gluons. The collaboration is stably configured for the era beyond data taking for about three years.

The PRC continued it's discussion in the closed session.

**The PRC is happy to note that the HERMES experiment has established a stable management team for this year's data taking period as well as the era beyond. The PRC congratulates the HERMES collaboration for efficient data taking, steady stream of high quality physics results, and prioritizing analysis topics in order to complete important physics analyses with the full dataset. The PRC notes that human resource outlook for the highest priority analyses looks good. The PRC recommends that the laboratory continue the high level of support of the collaboration to guarantee excellent physics results and publications in the coming years.**

### **Item 4: LC Detector R&D**

The vertex detector for the ILC requires outstanding performance, in particular topological vertexing and jet flavour identification have to be optimized. Minimum layer thickness, very high segmentation, very high precision and fast readout are the main concerns to meet the physics requirements. Concepts for vertex detectors are based on CMOS technology, on DEPFET technology and on flavour identification using CCD sensors.

#### **Item 4.1: Review of the DEPFET Collaboration**

H.-G. Moser presented the status of the DEPFET pixel detector project.

The project was reviewed by J. Timmermans and K.-T. Knöpfle.

Since the last PRC meeting in May 2005 pending issues have been addressed: Radiation tolerance tests were done with different types of particles; the full system was tested with beams at DESY and CERN. Resolution and limits on noise and readout speed have been determined.

DEPFET has been implemented in the ILC/LDC software framework; MC simulations reproduced the test beam data. Extrapolations showed that the ILC requirements are fulfilled. A new radiation hard, very fast switcher chip has been developed and is now operational. A new generation of current readout chips is being designed and tested. The technology to produce low mass modules has been established. Next steps are the production of new large ILC scale matrices, and the test operation of the full system at ILC speed. Simulation studies will be continued, and the impact of combined tracking with external tracking detectors needs to be studied. EMI studies will be performed as soon as the facility becomes available.

The collaboration was enlarged by new collaborators from Aachen, Karlsruhe, Prague, and Valencia.

The PRC continued the discussion in the closed session.

**The PRC congratulates the DEPFET collaboration for a well-focused R&D effort that has made very good progress. The PRC notes that there are pending issues including radiation tests of RO/steering chips that have not yet fully completed: the spatial resolution measurement with 50 micrometer thin detectors, the readout speed on the full system, checking the tolerance against EMI during bunch train, and checking power cycling. The PRC concludes that the DEPFET R&D program has made excellent progress and should be continued at full support.**

#### **Item 4.2: Review of the LCFI Collaboration**

There was no presentation of the LCFI collaboration in the closed session.

K.T. Knöpfle presented the referee's report for J. Timmermans and himself.

The LCFI Collaboration follows two directions, the study of vertex detector performance by simulations and by detector R&D. With the status report in May 2005 a programme proposed for 2005-2008(10) was submitted. Due to funding the original goal was revised; fulfillment of the ILC requirements has to be demonstrated for prototype sensors and electronics (not a full-scale prototype). The development of Flexible Active Pixel Sensors (FAPS) as well as test beam and EMI studies could not be funded.

A second generation of high speed CCD has been developed, the successful operation of Column Parallel Charge-Coupled Devices (CPCCD) has been demonstrated at 45 MHz but not yet at 50 MHz. The chip capable of producing the clock signals needed to drive the CPCCD has been developed. The functioning of the In-situ Storage Image Sensor (ISIS) concept has been demonstrated and a second generation ISIS design is nearing completion. Materials for the construction of ladders with a thickness of  $0.1\% X_0$  were identified; test ladders were constructed and surveyed.

Sophisticated software for vertex finding, flavour identification and quark charge separation has been developed and is available for public use.

Although the manpower and the number of contributing institutes increased, the concerns about sufficient manpower to reach the goals as scheduled are not all alleviated.

The discussion was continued in the closed session.

**The PRC recognizes that the R&D program of the LCFI collaboration has shown significant progress in the physics studies and the development of a fast Column Parallel CCD. The PRC acknowledges the reorganization of the group due to the fact that a number of members changed their affiliations. The PRC notes that although it will result in an increase in the number of contributing institutions and physicist resources starting next year, this transition may cause slow progress in reaching their goals. The collaboration has an ambitious yet sound R&D program for the period from 2005 to 2008, and the PRC is fully aware of the expertise of the LCFI collaboration for performing this program. The PRC recommends that the LCFI R&D program should be continued at full support.**

#### **Item 4.3: Review of MAPS**

No presentation was given by the MAPS collaboration in the closed session. K.T. Knöpfle and J. Timmermans reviewed the status of the project. Among several options for vertex detectors for an ILC, Monolithic Active Pixel Sensors (MAPS), provide one very promising technical solution: Sensor diodes and associated readout microelectronics are integrated on the same silicon substrate and can be manufactured cost-effectively in standard CMOS technology. Since the last review a fast column parallel, prototype (MIMOSA-8) with integrated signal discrimination was validated with particle beams, and translated into a manufacturing process featuring a thicker epitaxial layer. The development of fast ADCs is making good progress: A mature ADC design is achievable for early 2008; a first sensor equipped with an ADC is planned to be fabricated in 2008. A first prototype featuring a zero suppression logic and output memories is being designed for STAR and EUDET telescope, a second generation targeting the ILC requirements is foreseen to be fabricated in 2008. Sensors made using the AMS-0.35 OPTO process show detection efficiencies of about 99.8% for temperatures up to 40°C.

New generations of real size sensors with higher readout frequency and higher ionizing radiation tolerances are being produced. A new fabrication process using BiCMOS technology was explored. Radiation tolerance studies were performed but have to be completed including tests with 10MeV electrons.

The discussion was continued in the closed session.

**The PRC congratulates the MAPS collaboration for broad, but well-focused R&D efforts with very good progress. The PRC recognizes that the running experience with MAPS at STAR and EUDET beam telescope could be significant. The PRC notes that there are pending issues including the radiation tolerance measurement with 10 MeV electron beams, further power cycling tests, full system integration, and checking the tolerance against EMI during bunch train. The PRC encourages the PRC DESY management to look at the full system integration. The PRC concludes that the MAPS R&D program has shown substantial progress and should be continued at full support.**

## **Item 5: LHC: ATLAS and CMS Experiments**

There was no presentation from the LHC groups in the closed session. J. Brau presented for J. Timmermans and himself the referee's report on the DESY LHC groups. Both groups are well integrated in the LHC collaborations and made already significant contributions on several activities.

In spring 2007 the DESY ATLAS group consisted of 7 staff physicists, 5 postdocs and 5 PhD students, and works in close collaboration with the computing centers, with the University of Hamburg and Humboldt University Berlin. The activities include contributions to physics (SUSY, Standard model analyses and top quark physics), to the high level trigger, to the ECAL software (fast shower simulation), and to ATLAS computing.

The DESY CMS group is formed by 10 staff members, 1 engineer and 3 PhD students, collaborating with German groups. Main contributions are software development for the high level trigger, technical coordination and integration at CERN, and physics analysis, in particular the Standard Model physics (Coordination and editing the Physics TDR).

A main contribution to the LHC experiments is the operation of Tier II centers for both of the experiments, ATLAS and CMS, and the support for German LHCb groups. The installation is well ahead of commitments. The Tier II centers are part of the National Analysis Facility.

The theory effort in support of the LHC experiments is important.

Within the Helmholtz Alliance – Physics at the Terascale – the collaboration with other German LHC groups is being intensified.

The discussion was continued in the closed session.

**The PRC recognizes that both the ATLAS and CMS groups at DESY have been well integrated and active in the ATLAS and CMS experiments and have already been making significant contributions on several activities such as high level trigger and DAQ, software, and commissioning / technical coordination. DESY's activities on both experiments are well recognized by respective experiment's management and the PRC congratulates DESY's ATLAS and CMS groups for their achievements. The Helmholtz Alliance is well matched to this effort, provides valuable additional strength, and is a welcome addition. The PRC encourages the ATLAS and CMS groups to continue to keep their focus on the energy frontier physics.**

## **Item 6: Review of ALPS**

The experiment ALPS (Axion-Like Particle Search) is a collaboration between DESY, the Laser Zentrum Hannover e.V. and Hamburger Sternwarte, and was proposed to test the interpretation of recent experimental results of PVLAS and BFRT in terms of new very light bosons (axion-like particles). Axion-like particles could be produced by conversion of photons in a strong magnetic field. In contrast to photons they can pass through a wall and could be detected after reconversion to photons. The measurements would also allow setting limits on the existence of para-photons; the expected sensitivity has still to be quantified.

There was no presentation in the closed session by the ALPS collaboration.

G. Quast presented the referee report for J. Kühn and himself. The ALPS proposal was reviewed in February 2007 and recommended. The design of ALPS had to be revised in two main aspects: (a) After the correction of an error in the theoretical predictions the buffer gas foreseen to adapt the photon momentum to the momentum of heavier axion-like particles would not work in the HERA dipole magnet. An alternative is the incorporation of phase shift plates. (b) The laser wave length had to be changed from infrared to green. Due to these modifications the sensitivity to axion-like particles is reduced by a factor 2, but still sufficient to check whether the PVLAS results are caused by them.

The PRC continued the discussion in the closed session.

**The ALPS proposal was reviewed by the PRC in February, 2007 via a telephone meeting, and was recommended. The PRC notes that since February, 2007, changes were made due to the sign error in the theoretical calculation, resulting in abandoning the buffer gas and adopting phase retardation plates. The PRC also notes changes in the laser from infra-red to green and in the photon detector. Although the sensitivity is about a factor of 2 lower than presented in February, the new ALPS experiment is still expected to achieve the main goal, namely to check on the PVLAS signal, and the hardware set-up of the modified experiment is progressing well, and the original schedule of start-up date August 2007 will not be affected by the new set-up. Thus, the PRC continues to support the ALPS and recommends that the DESY management pay attention to needed personnel resources.**

## **Item 7: AOB**

The dates for the next PRC meeting are November 8<sup>th</sup> - 9<sup>th</sup>, 2007.

### **Item 7.1: Internal Target Experiment at DORIS**

**The PRC heard from Richard Milner on a possible new experiment at DORIS using the available MIT-BLAST detector and an unpolarized hydrogen gas target. The goal of the experiment is to determine the contribution of multiple photon exchange processes and to resolve the existing discrepancy in lepton-nucleon scattering data. Dedicated data taking for one month per year for several years would be sufficient to carry out the experiment. The PRC decided to form an external referee group to review the proposal which is expected to be ready by the end of May.**

**The current list of PRC referees is:**

P. Buchholz, T. Lohse:	H1
R. Forty:	
R. Milner, N. Saito:	HERMES
Y.-K. Kim, G. Quast	ZEUS
G. Anton:	AMANDA/IceCube
P. Buchholz, R. Milner:	POL2000
J. Brau, J. Timmermans:	R&D for the ILC
W. Hollik, J. Kühn:	Theory
J. Brau, J. Timmermans	LHC
W. Hollik, J. Kühn,	
T. Lohse, G. Quast	Low Energy HERA Running
J. Kühn, G. Quast	ALPS

**Invited Reviewer:**

K-T Knöpfle:	R&D for the ILC: DEPFET, LCFI-CCD, MAPS
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(S. Riemann – October 2007)

