PRC 63 Recommendations

1. News from the Laboratory

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.

2. Mid-term Evaluation of the Helmholtz Senate recommendations

During the 63rd 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.

3. HERA

- **HERA Machine**

  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^{-1} 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^{-1}. About 10 pb^{-1} 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 63rd 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.

- **Beam Polarization**

  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 ~10% between TPOL and LPOL measurements, resulting in a ~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.

- **HERA Experiments**

  - H1 and ZEUS

    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 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 pb^{-1} of the originally planned 10 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.

  - HERMES

    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.

4. LHC

- ATLAS and CMS Experiments

  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.

5. ILC Detector R&D

- DEPFET Collaboration

  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.

- LCFI Collaboration

  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.

- MAPS

  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.

6. ALPS

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.

7. 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.

Y-K Kim, R. Forty June 2007