

Short Minutes of the BVR 37

Meetings of February 16 – 17, 2006

1 Meetings of the Committee

closed meetings: Thursday, February 16, from 9:00 – 12:30

Friday, February 17, from 9:00 – 11:50

present: A. Blondel

D. Bryman

P. Cenci

C. Hoffman (chair)

S. Paul

J. M. Pendlebury

R. Rosenfelder (secretary)

L. Tauscher

D. Wyler

local consultant: C. Petitjean

external consultant: A. Ceccucci (till Thursday 10:30)

from the “Forschungskommission”: L. Simons

2 New Proposals

2.1 R-05-01.1: Precise Measurement of the $\pi^+ \rightarrow e^+\nu$ Branching Ratio (D. Poganic, A. van der Schaaf *et al.*)

Recommendation: This proposal has been submitted by a strong group using a well-understood detector. The physics case of the proposed measurement is very strong and a successful outcome of the experiment will allow tests of a variety of theoretical predictions, especially those related to $\mu - e$ universality. The goal of reaching the proposed accuracy makes it a difficult measurement limited primarily by systematic errors. The Committee approves the proposed experiment with high priority and it encourages the group to think creatively about how to improve the detector to do an even better measurement. A similar experiment to be performed at TRIUMF is considered to be healthy competition.

2.2 R-06-03.1: Pionic Deuterium (D. Gotta *et al.*)

Recommendation: The Committee considers the planned experiment as a natural extension of the excellent work done on pionic hydrogen. The theoretical motivation is valid even though

the many-body aspects make the interpretation less stringent than in the πH case. Consequently the Committee approves this experiment with moderate priority and expects it to run this summer.

3 New Letter of Intent

3.1 R-06-02.0: Measurement of the Circular Polarization of Gammas from Polarized Cold Neutron Capture in Solid Orthodeuterium on FUNSPIN (A. Komives *et al.*)

The Committee believes that the theoretical motivation for this measurement needs to be strengthened. It is unclear whether this LOI addresses feasibility study for a future experiment or a proposal for a real physics measurement. In the latter case it might be useful to improve the performance of the polarimeter. However, in general the Committee is not very enthusiastic about the LOI in its present form and thinks that additional work needs to be done before turning it into a full proposal.

4 Progress Reports and Beam Requests

The Committee received 10 Progress Reports most of which were presented orally in two afternoon sessions on Wednesday (February 15) and Thursday (February 16). In addition, there were overview talks on experiments R-99-05 and R-04-02. The Committee thanks all speakers for their excellent presentations from which much was learned.

R-96-04: Search for Time Reversal Violating Effects in the Decay of Free Neutrons (K. Bodek *et al.*)

The experiment encountered unfortunate problems with the spin-flippers during the 2004 run, which greatly reduced their efficiency. Therefore the 2004 data are of only limited use. Assuming that the spin-flippers will be repaired the Committee recommends another run this year, which should give good physics results.

R-97-05: Precision Measurement of Singlet μp Capture in Hydrogen (P. Kammel, C. Petitjean *et al.*)

Good progress was reported for this experiment, particularly with the new isotope separation column which allows a considerable reduction in the deuterium concentration. The requested 10 weeks of beam time in 2006 for data taking are fully approved.

R-98-03: Lamb-Shift in Muonic Hydrogen (F. Kottmann, R. Pohl *et al.*)

The Committee is impressed with the progress in the laser system, the mirrors and the coatings. It also appreciates the improvement in the collaboration management structure and considers that to be a step in the right direction. Although the Committee would like to see this experiment run this year, there is no realistic chance that this can happen. The apparatus will not be ready by early summer 2006, the only window of opportunity in $\pi E5$ this year: there is a conflict with the MEG experiment later in the year. Consequently the recommendation is to tentatively schedule a 4-week run in the beginning of the 2007 beam period with the purpose of searching for the resonance. We reiterate the recommendation from last year that requires the demonstration of the successful operation of the new laser system before any beam time is granted.

R-99-06: Precision Measurement of the μ^+ Lifetime (G_F) with the FAST Detector (J. Kirkby, M. Pohl *et al.*)

The Committee recognizes the progress that has been made to date but is quite disappointed with the overall status of the project. Problems with the DAQ and TDCs need to be fixed before 10^{12} events (or even 10^{11} events this year) can be accumulated. The Committee believes that the project needs a dedicated, sustained effort to solve these problems. Thus the Committee approves 6 weeks of beam time to work on solving the DAQ and TDC problems but does not consider data taking at the presently achievable rates to be a sensible option. If the collaboration is able to demonstrate successful data taking at substantially higher rates, it should then request more beam time by electronic communication.

R-99-07: A Precision Measurement of the Positive Muon Lifetime Using a Pulsed Muon Beam and the μ Lan Detector (D. Hertzog, R. Carey *et al.*)

The Committee is quite pleased with the progress of this experiment and thinks it is well on the way to acquiring final data. Past funding problems have been overcome and there has been excellent work on the kicker and the waveform digitizer. The requested beam time is fully approved.

R-03-01: High-Accuracy Measurement of the Spin-Dependent Neutron Scattering Length of the Deuteron (O. Zimmer *et al.*)

In the opinion of the Committee this is an elegant but challenging experiment. Some problems were encountered last year due to inhomogeneities in the frozen-spin target, which reduced the Ramsey signal. This has been overcome with new target samples, which show the full paramagnetic phase shift. We look forward to results from the run in 2006 in which the first precision measurements will be performed.

R-04-02: Measurement of the UCN Production Efficiency on Solid D_2 and Comparison with the Solid Cryogenic Materials CD_2 and O_2 (K. Kirch *et al.*)

The Committee acknowledges the broad-range measurements that have been made and supports this nice experiment.

R-05-02: Measurement of Cold Neutron Depolarization in Liquid and Solid Deuterium (M. Snow *et al.*)

We acknowledge the receipt of a report outlining the preliminary results of these measurements.

R-99-05: Search for $\mu^+ \rightarrow e^+\gamma$ (T. Mori, A. Baldini *et al.*)

Continuing good progress is seen in this challenging experiment, in particular, in the software. However, the remaining construction schedule is extremely tight and the Committee is worried about possible problems with the drift chambers, the calibration and analysis procedures, and problems with the procurement of the Cockroft-Walton accelerator. Contingency plans are needed should significant delays result from these or other factors. A separate report written by the special Technical Review Committee gives more details. The Committee strongly feels that it is extremely important to obtain some data this year. Only then one can expect substantial production data in 2007 before the LHC starts. There will be a 1-day review of the project by the Technical Review Committee this summer.

R-00-03: The PSI Ultra Cold Neutron Source (M. Daum *et al.*)

The Committee acknowledges the impressive progress made in this project. This is a good start with many accomplishments. For details see the separate report written by the special Technical Review Committee.

R-05-03: Measurement of the Neutron Electric Dipole Moment (O. Naviliat-Cuncic, K. Kirch *et al.*)

The Committee is quite impressed by the good start by the collaboration which took over the RAL apparatus at ILL and the many accomplishments achieved with it. However, the question of whether the future will see a renewed experiment at ILL, a move of the apparatus to PSI, or a new detector at PSI remains unsettled. The Committee considers this to be an important issue for both the collaboration and the Laboratory and notes the lack of a concrete plan for a definite EDM measurement at PSI despite the high priority assigned to this proposal. The Committee recommends that the Laboratory issue public call for UCN proposals at the PSI-UCN source.

The status of the MEG and the nEDM experiment were presented in detail during a morning session on Wednesday (February 15, 2006). See the special reports by the Technical Review Committee for MEG (A. Blondel, A. Ceccucci, P. Cenci, C. Hoffman) and for nEDM (D. Bryman, S. Paul, M. Pendlebury, L. Tauscher, D. Wyler).

5 Thanks

The chairman wishes to thank Claude Petitjean, who will retire this summer, for his many years of dedicated work as Committee organizer, beam-time coordinator, and Program Committee consultant.

6 Next Meeting

The next meeting (BV 38) is again scheduled as a 3-day meeting, tentatively for Wednesday - Friday, February 14 - 16, 2007.

Another special (however, less formal) review for the MEG experiment is scheduled for summer 2006.

March 18, 2006

C. Hoffman, R. Rosenfelder