

# Short Minutes of the BVR 38

## Meetings of February 15 – 16, 2007

### 1 Meetings of the Committee

closed meetings: Thursday, February 15, from 9:00 – 12:30  
Friday, February 16, from 9:00 – 11:30

present: A. Blondel  
D. Bryman  
P. Cenci  
C. Hoffman (chair)  
S. Paul  
R. Rosenfelder (secretary)  
L. Tauscher

excused: J. M. Pendlebury

local consultant: C. Petitjean

ex officio: A. Denner  
R. Eichler, H. Gaggeler (on Thursday)

for Progress Report of R-05-01: D. Pocanic, A. v. d. Schaaf, W. Bertl (Friday till 9:35)

### 2 New Letter of Intent

**R-07-01.0: A Precision Measurement of the Neutron Lifetime in a Trap with Superconducting Magnets** (J. Hartmann *et al.*)

The Committee is quite enthusiastic about this well-motivated project as correct, accurate measurements of the  $n$ -decay observables are very important. We look forward to a full proposal, which should contain a discussion of costs, project management and manpower, as well as experimental details and information on systematic errors. If such a proposal were submitted to the Committee before our scheduled meeting in 2008, we would judge it earlier via e-mail so as to avoid undue delay.

### 3 Progress Reports and Beam Requests

The Committee received 11 Progress Reports of which 5 were presented orally in the afternoon session on Thursday (February 15) and one on Wednesday. In addition, there were overview talks on experiments R-99-05, R-00-03 and R-05-03. The status of experiment R-05-01 was presented to the Committee on Friday morning.

The Committee thanks all speakers for their excellent presentations, which we enjoyed – especially the beautiful new physics results.

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

The Committee believes that this experiment is doing well. We recommend that there be a long production run this year, which should complete this project and lead to an interesting physics result.

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

The Committee would like to congratulate the collaboration for a technical tour-de-force which resulted in beautiful physics results as seen on the first page of the progress report. Data to be acquired this year will help in the study of systematic errors. It is expected that this run will complete this experiment.

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

The Committee acknowledges the good progress made with the new laser system and recommends an 8-week data-taking run in the middle of the year. However, before this beam time is granted the collaboration should demonstrate to the beam coordinator (C. Petitjean) that the laser system is fully operational in the experimental area. After the long history of this project we eagerly await the results.

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

There was a half-day Technical Review of this Experiment on Wednesday (February 14). The Committee is disappointed that slow progress is being made and that many problems have arisen. A crucial milestone will be the upcoming test of the new honeycomb window for the liquid xenon cryostat. The Committee considers the stated goal of production data taking this fall as unrealistic (regardless of the outcome of this test) and does not give this experiment highest priority for all available beam time this year. Instead we provisionally recommend that the muonic Lamb-Shift experiment (R-98-03) use 8 weeks of  $\pi E5$  beam time starting at the end of June. Before and after that period the beam should be available to the MEG collaboration. We hope that the collaboration is able to assemble all of the equipment and acquire some engineering data this year. A detailed report of the Technical Review will be prepared.

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

The Committee is impressed with the progress made last year by this group. However, several difficulties remain, especially ongoing TDC problems: in addition, an operational efficiency of only 40 % is unacceptable. We are disappointed that the collaboration has scaled back their

goal in the accuracy of the measured lifetime by a factor of 2. We believe that the collaboration suffers from a lack of personnel fully committed to the project. The Committee recommends 10 weeks of beam time to address the outstanding technical problems but requests a written progress report before beam time will be granted for a data-taking run. Some members of this Committee will be at PSI during the week of July 16 for a review of the MEG/UCN projects: this would be a good time to discuss this progress report and decide if a data-taking run is warranted.

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

The Committee offers its congratulations for a beautiful experiment: again physics results on the front page of a very detailed progress report! The beam requests are fully supported and it is hoped that the ongoing analysis will lead to the proposed accuracy in the measured muon lifetime.

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

The Committee is quite impressed by the continued progress in this project which is in the engineering phase.

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

This is a challenging experiment employing several new techniques. While several experimental problems have been solved, there are still difficulties with the cryostat and the inhomogeneity of the target that may reduce the accuracy of the measurement of the neutron-deuteron scattering length. Nevertheless the Committee fully endorses the efforts of the collaboration.

**R-05-01: Precise Measurement of the  $\pi^+ \rightarrow e^+\nu$  Branching Ratio** (D. Pocanic, A. van der Schaaf *et al.* )

The Committee received a short written report and heard a more detailed Progress Report on Friday morning. We believe that the collaboration is making progress in testing equipment necessary for the experiment. The Committee endorses these efforts towards this important measurement. While more studies of systematic effects are still needed, we hope that the collaboration can take data this year with a goal of matching the accuracy of past experiments. We hope that full data-taking will occur next year.

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

While no beam time was requested a brief Progress Report was received. The Committee is looking forward to a publication of the results of this measurement.

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

There was a half-day Technical Review of this project on Wednesday (February 14). The Committee is impressed by the progress being made. We are pleased by the systematic approach being taken by the collaboration, which has led to the solution of several important technical issues. The schedule for the next few years calls for different phases at ILL and PSI, which make sense in the opinion of the Committee. However, it may not be the best strategy to design a new detector at the same time as running the old one. A detailed report of the Technical Review will be prepared.

The status of the MEG and the UCN/nEDM experiments were presented in detail during a full day session on Wednesday (February 14, 2007). See the special reports by the Technical Review Committee for MEG (A. Blondel, P. Cenci, C. Hoffman) and for UCN/nEDM (D. Bryman, S. Paul, M. Pendlebury, L. Tauscher).

## 4 Miscellaneous

The replacement of D. Wyler in the Program Committee was discussed. There was general agreement that R. Rosenfelder provides good theoretical input to the Committee and that another theoretical physicist is not needed at this time. Additional theoretical advice can be obtained by consulting individual experts in the field, when necessary.

## 5 Next Meeting

The next meeting (BV 39) is again planned as a 3-day meeting, tentatively for Wednesday - Friday, February 20 - 22, 2008.

Another special review for the MEG and UCN/nEDM experiments is scheduled in the week of July 16, 2007.

February 28, 2007

C. Hoffman, R. Rosenfelder