

Short Minutes of the BVR 40 Meetings of February 18 – 20, 2009

1 Meetings of the Committee

closed meetings: Thursday, February 19, from 9:00 – 12:15
Friday, February 20, from 9:00 – 11:30

present: D. Bryman
P. Cenci
B. Filippone
C. Hoffman (chair)
S. Paul
J. M. Pendlebury
R. Rosenfelder (secretary)

excused: A. Blondel

local consultant: C. Petitjean

external consultant: A. Ceccucci (on Thursday)

ex officio: A. Denner

H. Gägeler (on Thursday), J. Mesot (on Thursday), K. Clausen (on Friday)

additionally on Friday morning: : R. Scheuermann, and M. Hildebrand, T. Mori, and S. Ritt
for information relevant to R-09-01 and the MEG drift
chambers, respectively

At the beginning the chairman recounted the many important contributions which *Ludwig Tauscher*, who passed away several months ago, provided to PSI and to this Committee over many years.

2 New Proposals

R-07-01: A Precision Measurement of the Neutron Lifetime in a Trap with Superconducting Magnets (R. Picker *et al.*)

The Committee considers this an important measurement and likes the overall experimental design. While it strongly endorses the concept, it also feels that the proposal is lacking in sufficient detail concerning, in particular, the estimation of systematic errors. Therefore the Committee does not formally approve this proposal but is requesting a more technically detailed report that the group may submit at any time. In addition, there are some concerns with respect to the size and strength of the group and the co-ordination of the whole effort with PSI.

R-09-01: Muon Effects and Development of X-Ray Gated Muon Spin Relaxation
(A. Jason *et al.*)

The Committee does not approve this proposal as it lacks a strong scientific justification and seems to be focused mostly on technical developments. In addition, the proposed X-ray gating technique has already been used before with no obvious gain: The reduction in background is offset by the subsequent loss in acceptance. The Committee also notes that the requested beam-line is heavily oversubscribed.

3 Progress Reports and Beam Requests

The Committee received 9 Progress Reports of which 6 were presented orally in the afternoon session on Thursday (February 19).

The Committee thanks all speakers for their presentations which were very helpful and informative. It also acknowledges the written progress or status reports by the Lamb Shift, MuLan and MuSun collaborations.

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

The Committee congratulates the group after finishing a long but successful journey and is pleased with the results. As expected a T-even term was detected experimentally but the time-reversal violating term was not. There are still some improvements to be expected with further analysis.

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

From all indications the collaboration is ready to take beam and the Committee is keeping its fingers crossed for a successful run. In hindsight, last year's decision to allocate the beam time at the beginning of the 2009 run has worked out pretty well.

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

There was a special review of this experiment on Wednesday morning (February 18). A detailed report of the Technical Review Subcommittee (A. Ceccucci, P. Cenci, C. Hoffman) is in preparation.

The Committee is quite impressed by the significant progress made by the collaboration but believes that many more improvements are still necessary. This is underlined by the fact that in last year's run not a single resolution achieved its planned level and that calorimeter gain changed significantly over time. A lot of detailed work is required to obtain a stable, high-resolution detector.

There are particular significant concerns with the state of the drift chambers and with the manpower allocated to address this problem. Although progress has been made in the diagnosis of possible causes it is clear that the entire schedule of the experiment is determined by the availability of working drift chambers. Therefore the Committee asks for a short written report

on the status of the drift chambers every 2 months and a written report on the state of the whole project this July. A lot of other issues will be addressed in the detailed technical report. A new run will presumably start at the end of September.

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

The Committee is very pleased with the tremendous progress made by the group. It expects that enough data will be acquired this year to achieve the stated goal.

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

There was a detailed review of this project on Wednesday afternoon (February 18) with a technical report written by the special Subcommittee (D. Bryman, B. Filippone, St. Paul, M. Pendlebury) to follow.

Overall the Committee is very pleased by the good progress being made and is looking forward to the production and observation of the first UCNs.

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

The Committee thanks the collaboration for a nice, detailed progress report which – together with the oral presentation – convinced it that the experiment is doing well. A new TPC will help to get rid of some background. Good luck for a good 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 afternoon (February 18) and a more detailed report will be prepared.

In general the Committee is convinced that the collaboration had a good year: Many problems have been diagnosed and solved. The present detector at ILL is being moved to PSI where a lot of construction and engineering work is to be performed. The Committee is impressed by the nice work on the magnetometers and happy with the approach taken to develop the new detector for the final measurement (phase III).

R-08-01: Muon Capture on the Deuteron - The MuSun Experiment (P. Kammel, C. Petitjean, A. Vasiliev *et al.*)

The Committee took note that the collaboration is making good progress and already building parts of the apparatus. However, no beam time is requested for this year.

4 Miscellaneous

W. J. Marciano (Brookhaven National Laboratory) gave an Invited Talk on “Fundamental Physics with Pions, Muons and Nucleons” in the Open Users Meeting on Wednesday afternoon. This talk was very well received by the audience and the Committee members. It is hoped that such overview talks may become a standard part of future BV’s.

5 Next Meeting

The next meeting (BV 41) is again planned as a 3-day meeting, tentatively for Wednesday - Friday, February 17 - 19, 2010. The technical review of the MEG and UCN experiments will take place on the first day.

March 4, 2009

C. Hoffman, R. Rosenfelder