

Short Minutes of the BVR 29 Meetings of July 5/6, 1999

1 Committee meetings

Closed meetings: Monday, July 5, from 9:00 – 12:45

Tuesday, July 6, from 9:00 – 11:45

Present: D. Bryman

C. Hoffman

J.P. Perroud

L. Tauscher

P. Truöl (chair)

G.J. Wagner

D. Wyler

Special consultant: D. Schinzel (CERN)

Local consultants: M.P. Locher

C. Petitjean

R. Rosenfelder (secretary)

Observer from the “Forschungskommission”: Q. Ingram

Ex officio: R. Eichler (partly)

2 Beam requests

R-87-03 Search for μe conversion (A. v.d. Schaaf *et al.*)

R-89-01 A precise measurement of the $\pi \rightarrow \pi^0 e^+ \nu$ decay rate (D. Počanić *et al.*)

R-97-02 Precision measurement of the charged pion mass (D. Gotta *et al.*)

All beam requests for approved experiments were supported and can be met within a modified beam time schedule presented by C. Petitjean.

3 Progress report

The committee acknowledges the receipt of the progress report about experiment **R-98-02**: Measuring μd ^3He fusion (F. Mulhauser *et al.*), which was requested in the last meeting.

4 New proposals

4.1 Precise measurements of the μ^+ lifetime τ_μ

R-99-06.1 : Precision measurement of the μ^+ lifetime (G_F) with the FAST detector (F.R. Cavallo *et al.*; spokesmen: J. Kirkby. M. Pohl)

R-99-07.1 : A precision measurement of the positive muon lifetime using a pulsed muon beam and the μLan detector (R.M. Carey *et al.*; spokesman: D.W. Hertzog)

Recommendation : The committee considers the efforts to measure the muon lifetime 20 times better than presently known as worthwhile and important for future precision tests of the Standard Model although now other parameters are less well known. Given the difficulty of reaching the planned accuracy it may be worthwhile to consider having two independent and complementary experiments. The committee recommends to proceed with the μ Lan proposal. It defers the decision about the FAST proposal to the next meeting until more detailed simulations and estimates are available, in which all potential systematic effects influencing the expected results including muonium formation are assessed.

4.2 Search for the decay $\mu \rightarrow e\gamma$

R-99-05.1 : Search for $\mu^+ \rightarrow e^+\gamma$ down to 10^{-14} branching ratio (L.M. Barkov *et al.*; spokesman: T. Mori)

Update and supplement to the letter of intent R-98-05.0 : Search for the decay $\mu^+ \rightarrow e^+\gamma$ (MUEGAMMA collaboration, A. Baldini *et al.*)

Recommendation: The committee is convinced that a measurement of the lepton-flavor-violating decay $\mu \rightarrow e\gamma$ down to branching ratios of 10^{-14} is of fundamental importance and high priority. It is grateful for the special advice by Dieter Schinzel (CERN) concerning the experimental and technical issues of liquid Xenon detectors. It recommends to proceed with the proposal by Mori *et al.* which shows promise to reach a sensitivity down to 10^{-14} , several orders of magnitude below present sensitivities with a combination of a novel photon detector and a positron spectrometer employing an inhomogenous magnetic field. Given the scope and difficulty of the planned experiment, the committee has decided to list a number of questions to be answered and technical developments to be demonstrated (“milestones”) by the collaboration, before the assembly of the experiment at PSI can be started, beam time can be scheduled and data taking can commence. These points are listed in a special appendix, and the progress to achieve these essential goals will be monitored by two appointed referees (C. Hoffman, and D. Schinzel). A timetable for the milestones should be agreed upon after consultation between the collaboration, the referees and PSI-management.

The committee appreciates the efforts of the MUEGAMMA collaboration to study beam intensity and area background effects, which are an important ingredient for any successful attempt to measure such a low branching ratio. It encourages the members of the MUEGAMMA collaboration to bring in their expertise into a joint effort of both collaborations, where the crystal option for the photon detector with the appropriate technical research and development could still be considered as a backup solution, should the liquid Xenon option fail to meet the required specifications.

5 Next meeting

The next meeting (BV30) is planned for Monday/Tuesday January 17/18 2000. The deadline for submission of documents to BV30 is Friday, November 26, 1999.

July 21, 1999

P. Truöl, R. Rosenfelder *et al.*