Minutes of the 2nd Meeting of the
COSY Beam Time Advisory Committee (CBAC)

June 29-30, 2015
Location: IKP, Forschungszentrum Jülich

Participants:

CBAC members:

Aulenbacher, Kurt Univ. Mainz, DE
Chao, Alexander W. SLAC, US
Kester, Oliver GSI, DE (excused)
Schmidt, Christian Joachim GSI, DE
Steffens, Erhard Univ. Erlangen-Nürnberg, DE (chair)
Trubnikov, Grigory V. JINR Dubna, RU
Weber, Marc KIT, DE

CBAC secretary:

Frank Goldenbaum (IKP-1)

IKP:

Mei Bai (IKP-4 Director)
Ulf-G. Meißner (IKP-3 Director) (excused)
Ralf Gebel (IKP-4, representative of the IKP staff)
James Ritman (IKP-1 Director, IKP Managing Director) (excused)
Hans Ströher (IKP-2 Director, Scientific Coordinator COSY)

Board of Directors FZJ: Sebastian Schmidt (excused)

1. General remarks

The 2nd CBAC session took place on June 29-30th in the Institute for nuclear research (IKP) of Forschungszentrum Jülich. A general overview of the experiments and campaigns anticipated at the COSY accelerator for the second half of 2015 and the first half of 2016 along with the beam requests of the individual groups was given in the open session of the CBAC#2 meeting (for the programme and the list of applications see the Addendum).

Closed sessions of the CBAC members took place on Monday morning 9:00-9:40, Monday evening 18:00-19:00 and Tuesday until 13:00. The closed session was opened by Hans Ströher (Scientific Coordinator COSY) welcoming the participants listed above. Oliver Kester (CB*AC member*), James Ritman (IKP-1 Director, IKP Managing Director), Ulf-G. Meißner (IKP-3 Director) and Dieter Prasuhn (IKP-4, representative of the IKP staff) are excused for not being able to participate in the CBAC session.

Hans Ströher welcome all CBAC members, introduced Mei Bai as the new IKP-4 Director and successor of Rudolf Maier and summarized the strategy and projects of IKP in the framework of the POF-3 period (2015-2019) with emphasis on EDM and FAIR (HESR, PANDA) activities. Hans Ströher mentioned the activities of the new branch on neutrino physics, which will be represented by a new W2 position in IKP2.
Hans Ströher also mentioned the initiative of the new head of the board of directors Prof. Wolfgang Marquardt to develop a long term strategy of all institutes of the Forschungszentrum Jülich, i.e. not only for the POF-3 period (2015-19), but also on a longer time line (~2030).

The directors of IKP were welcomed to join the closed sessions also on Monday evening and Tuesday. A tentative beam time skeleton was presented in the open session by Ralf Gebel allowing for about 14 weeks both for II/2015 and I/2016 for EDM, FAIR and potential external activities, after taking into account machine development and maintenance.

An overview of all the applications to CBAC#2 is given as a table in the Addendum. The electronic versions of all proposals and reports as well as the pdf files of all contributions presented in the open session of CBAC#2 are located on the web page
http://www.ikp.fz-juelich.de/CBAC/documents/cbac02.html

2. Summary of the discussion and recommendations:

a) Procedure After the proposals had been presented in talks in the open session and questions had been posed to the proponents from the audience and by CBAC members, a comparative discussion took place in the closed session. In particular, the proposals were scrutinized with special emphasis on

(i) **Feasibility** (here other assessments, like POF review or accepted proposals, may enter; also boundary conditions imposed by the facility have to be considered)
(ii) **Importance** (e.g. how important it is that this particular test needs to be done in this period)
(iii) **Readiness** (e.g. an assessment of possible risks that elements required for the test are not available in time)

All these considerations lead to a Rating A, B, C as explained above. In contrast to CBAC#1, there is no total rating given at this time, because the committee felt that the set of the three partial ratings represents in the best way the message of the committee to the Laboratory. - The result of the discussion is summarized in Table 1.

b) Comments to Table 1 The relevant figures are listed for all 12 applications (Note that the one JEDI request E1 in period I/2015 is now split into three separate requests E1-3).

For the applications related to FAIR (D1-5, A1-2), the start of the installation of HESR and the time of first beam are decisive for the COSY schedule. In addition, one external irradiation proposal (D6) and three short applications A3-5 on beam dynamic studies of general interest, the latter with a strong educational aspect, were submitted. All applications are supported by the committee, except a physics measurement as part of the test D5. For the other pillar of the program, preparations for the Search of the EDM of Ions (JEDI), a successful 'Precursor experiment', demonstrating the feasibility of this new method within the PF-3 period is of highest importance. Again, the proposals were ranked with high priority. A comparison of the requested with the available weeks (12 weeks in I/2015, 14 weeks in II/2015) shows that after a modest overbooking in I/2015 the request has remained stable, probably due to the uncertainty in the FAIR schedule. The committee expects an increase of beam time for detector and accelerator tests in future which – according to the present FAIR timelines – may have its peak in 2016/17.

Table 1: Summary of Evaluation and Recommendations of CBAC#2 for 2nd half of 2015. Items are: Experiment, number of weeks requested in 2nd half of 2015 (II/2015), for comparison also for I/2015; and the three partial ratings. In the last column, a number of weeks for II/2015 is recommended for every application, based on the discussion in the closed session.

Experiment	**Request I/2015 [weeks]**	**Request II/2015 [weeks]**	**Feasibility**	**Importance**	**Readiness**	**Recomm. II/2015 [weeks]**
D1 PANDA MVD	1	1	A	A	A	1
D2 PANDA STT	1	1	A	B	A	1
D3 PANDA HyperNuclei	1	-				No proposal in II/15
D4 CBM	2	1 (+1 in I/16)	A	A	A	1 (+1 in I/16)
D5 PANDA KOALA	0	2	A	A DAQ test C A_N meas.	A	1
A1 Machine Stochastic Cooling	1	1	A	A	A	1
A2 Machine Electron Cooling	2	2	A	A	A	2
A3-5 Beam dynamics	-	3x3 shifts	A	A	(A) see details in report	3x3 shifts or more if required
E1 JEDI SCT protons	(5) total	3	A	A	A	3
E2 JEDI Polarimeter	-	1	A	A	A	1
E3 JEDI Phase Lock.	-	1	A	A	A	1
SUM	**13**	**14** (in 2015)				**13**

c) Short reports and recommendations on individual proposals:

Proposal ***D001*** *Detector Tests for Microvertex-Detector*

The PANDA MVD group proposes a series of three related beam test periods starting 2015. One period has successfully been realized in spring. The panel endorses this request fully and ranks it triple A with respect to feasibility, importance and readiness. Assembled pixel modules are already available and have been tested with an early version of the data acquisition system (DAQ). In view of the planned engineering run of the final pixel readout chip, it is now of utmost importance to fully characterize the ToPix4 extensively and under realistic conditions in the application of a detector as a beam tracker. Any unanticipated features or changes of specifications of this important and complex detector element would have the potential to delay the whole project. Likewise, the evaluation and stressing of the new data acquisition system (of which first preliminary results were presented) at high rates is important and timely. The beam time requests for early 2016 will include strip detector systems and the evaluation of the PASTA strip readout chip. Here the final submission is scheduled for 2016 and again thorough characterization of the chip in its realistic environment and application is of utmost importance to the success and schedule of the project.

Ratings: Feasibility A Importance A Readiness A

Recommendation: 1 week in I/2016.

Proposal ***D002*** *Beam Request for STT Tests with dE/dx Readout for PID*

The PANDA STT will, as a straw tracker, serve PANDA as the central tracking system together with the silicon based MVD. The working group has long standing expertise in this well established straw drift detector technology and on systems based upon it. New, custom made readout electronics is to be tested in the beamtime demanded as well as system tests and optimizations to be realized with an extended setup. To this end, an overall of 4 weeks at COSY (Big Karl area) in 2015 is asked for, 1 week in the first two quarters has already been successfully realized. A particular focus is given to the evaluation of dE/dx resolution and performance concerning tracking and PID, even though the overall performance has convincingly been proven in 2014 for several momenta of protons as well as deuterons at COSY. However, the target of obtaining a full scan of dE/dx vs. beam momentum may be understood as a guiding theme along which the core technical evaluation of system performance is to be finalized.

It is indeed preferable for any tracking detector development to be evaluated on a real beam in as similar a situation to the final use case as possible. In particular towards a final choice, the evaluation of performance of the two alternative readout systems should be done in a real beam and tracking application with a system that may be considered similar in complexity as in the final application. Urgency is here related to pushing towards system decisions as soon as they are technically feasible in order to minimize parallel developments and to allow concentration of scarce resources.

The PANDA STT collaboration is rated as clearly ready to exploit the requested beamtime, the proposal being definitively feasible, as the targeted activities rather reflect incremental developments and their verification. An urgency for beam-tests to be realized in 2015 could not be seen. The CBAC thus rated this application as category B. The collaboration plans however to newly install their setup at the Big Karl area in Q3. Here it is indeed recommended to grant 1 week of beamtime so that the new arrangement may be made fully operative soon. Further beamtime, if available will advance the project.

Ratings: Feasibility A Importance B Readiness A

Recommendation: 1 week in II/2015.

Proposal ***D004*** *CBM detector and electronics tests at COSY*

The CBM experiment has given a comprehensive and convincing report on their use of COSY beam time in December 2014 (during the time of the previous CANU meeting in Bad Honnef) and February 2015. Encouraging results on the performance of STS sensors and modules were given, in particular on the signal-to-noise ratio before and after irradiation. More results on hit efficiency are still expected. Also the performance of a full-size triple-GEM module for the CBM Muon Chamber (MUCH) was established both stand-alone and in combination with a single-crystal diamond detector for precise timing. Again the spatial resolution of 160 microns and 100 ps are encouraging. The results of the irradiation of the power electronics (the LDO voltage regulators and CERN DC-DC FEAST converters) are promising and exceed the specifications. The same holds for the FPGA irradiation studies. The effort invested in setting up the characterization infrastructure (beam diagnostics, monitoring and data acquisition systems) will also benefit the requested future tests. It should be noted that it is significant effort to detect, understand and mitigate (partially using commercial tools) SEU effects in FPGAs and so the requested studies remain a high priority. The same goes for the measurement of the SEU cross section of the various STS-XYTER circuit blocks. These studies will also be required for future STS-XYTER versions.

One week of beam time has been requested for radiation hardness of electronics testing which should be fully granted.

Ratings: Feasibility A Importance A Readiness A

Recommendation: 1 week in II/2015 (plus 1 week in I/2016) .

Proposal ***D005*** *Beam Time Application for KOALA at COSY*

KOALA is a detector system for the determination of the pp or pp_bar luminosity of PANDA using Coulomb normalization and aiming at an absolute precision of about 3%. In its final version, it consists of a pair of recoil detectors left and right, covering the range close to $\theta_{lab} = 90°$, and a forward detector around the beam axis. One recoil detector has been built and tested in 2013 with an incomplete DAQ system without trigger handling. The aim of the proposed beam time is to confirm the capability of trigger handling of a new DAQ system.

In order to reach the required precision in pure Coulomb scattering, one could measure the recoils at very small |t| where Coulomb scattering vastly dominates over nuclear which is technically very difficult. As an alternative, the shape of the t-distribution in the Coulomb-Nuclear Interference (CNI) region can be studied and fitted with the forward scattering parameters. This has been demonstrated during the 2013 commissioning run. In order to test the underlying assumptions, the measurement of the pp analyzing power A_N is proposed, for which theoretical predictions exist. This would eventually allow using KOALA as a beam polarimeter.

The request includes (i) Cluster target, (ii) polarized and unpolarized proton beam (14 days in total) i.e. two weeks of measurement time plus MD. Besides confirming the new DAQ features, the beam time would enable to observe the predicted $A_N = 0.03 – 0.05$ in the CNI region. The CBAC unanimously supports the DAQ tests with unpolarized beam. Concerning the A_N measurement, the committee regards this part of the proposal as a physics program like the terminated ANKE program with no direct connection to the test of a detector. Therefore, one week of unpolarized proton beam is recommended, only.

Ratings: Feasibility A Importance - of DAQ test A, - of A_N measurement C Readiness A

Recommendation: 1 week in II/2015.

Proposal ***D006*** *Investigating proton induced SEE in modern microelectronics @ COSY*

The Fraunhofer Institut für Naturwissenschaftlich-Technische Trendanalysen (INT) is requesting 9 days of beam time for the investigation of single event effects (SEE) under irradiation. The INT and their group "Nuclear Effects in Electronics and Optics" have substantial experience with the investigation of irradiation effects in electronics. Their main focus is on irradiation effects in space, however there is substantial overlap with the needs of the FAIR and hadron collider communities. The INT knowledge in the simulation of SEU effects is valuable, also their use of ESA SEU benchmark monitors, and the further tuning of their models justifies the application.

The limitation of the request to the characterization of SRAM memories is reasonable. It should be noted that INT's approach and the use of commercial integrated circuits differs somewhat from that of the FAIR and the particle physics community where much stronger emphasis is put on FPGAs and custom integrated circuits. The latter approach has the advantage that both circuit design and technology aspects are accessible. Closer contact between INT and these communities would benefit the field.

This request comprising 27 shifts (9 days in 3 campaigns at 5 energies) is fully supported by the committee. The B in Importance is only given to indicate that this user is not from the FAIR or EDM community, but not on scientific grounds.

Ratings: Feasibility A Importance B Readiness A

Recommendation: the requested 27 shifts (see above).

Proposals ***A001&A002*** *Stochastic and Electron beam cooling*

The committee regards the present COSY laboratory as an ideal place and COSY one of the best machines in the world for experimental research on beam cooling. COSY has unique stochastic and electron beam cooling systems and a very professional team of scientists and engineers working on simulations and hardware. R&D on stochastic cooling (Filter and ToF methods, transverse cooling) are of great interest and scientific support for various projects at FAIR, JINR (NICA), BNL (RHIC injectors), and CERN (AD, ELENA, SPS). The committee is pleased that these activities have a high priority at IKP in its own interest and as a service to the accelerator community. It is encouraged to continue and extend collaborations with GSI (Darmstadt), JINR (Dubna), BNL (Brookhaven), BINP (Novosibirsk) and other Laboratories. Possible topics for research and development are the behavior of amplifier chains in Stochastic cooling systems and precise tuning of the system gain, exploring Time-of-Flight Stochastic cooling, the combination of the different cooling methods (SC + EC) with running a Barrier Bucket cavity. Others might be the study of coherent beam effects, hollow or bunched electron beams for cooling, and simulations of the cooling process. All these topics are important for the success of the JEDI project and the FAIR accelerator complex.

The committee acknowledges the high quality of the two proposals concerning the level of simulations and the technologies employed. It recommends one week for the study of Stochastic cooling and two weeks for the study of high energy Electron cooling. It should be investigated if some parts of these proposals could be combined, e.g. one week out of the the three could probably be used for combined stochastic and electron cooling experiments.

Ratings: Feasibility A Importance A Readiness A

Recommendation: 1 week in II/2015 (Stochastic. Cooling) and 2 weeks in II/2015 (Electron Cooling)

General comment to proposals A003 – A005, presented by the new machine director, Mei Bai:

The goal of all these short requests is to better understand COSY. A well understood accelerator is the basis to pursue future projects, especially high precision projects such as EDM. A high up rate is not the point. A deeper level of understanding the accelerator is the point. This is especially so for the EDM efforts.

Another goal of A3-A5 is for their academic and educational values. The committee strongly supports this goal and urges participation by the students.

A3-A5 do not request too much beam time, three shifts each, separated from each other. If more beam time is needed, the committee encourages the consideration of parasitic runs, either parallel to normal running or at some of the detector testing runs.

*Proposal **A003** Beam study topics: Nonlinear beam dynamics study at COSY with bunched electron and proton beam*

A3 aims to study nonlinear dynamics, motivated by FAIR and eRHIC applications, to establish the feasibility of bunched electron cooling. The proposed approach is to examine the emittance growth with modulation on the electron beam and identify its beam dynamics mechanism. In particular, a mysterious vertical instability was observed earlier and A3 proposed to understand it.

Since bunched-beam electron cooling is also under active study in other research laboratories elsewhere, a continued and close collaboration with BNL, GSI, Jlab is encouraged.

Rating Feasibility A Importance A Readiness A

*Proposal **A004*** *Beam study topics: Space charge dependant nonlinear beam dynamics study at COSY*

A4 proposes to study the effects of sextupoles (nonlinear dynamics) and space charge (collective effects). The topics to be covered, both nonlinear dynamics and collective effects, are important and should be studied. The cast is wide however, and not much beam time is requested, seemingly inconsistent with the goal of the proposal. This is reflected by the apparent lack of clearly specified deliverables of the study. Tunes as function of amplitudes is one result mentioned but there are other items not clearly specified.

It is not clear if all the simulation tools are available at COSY at the present time. If not, it is not a feasibility issue but it will require collaboration with other labs to acquire the necessary tools.

Rating Feasibility A Importance A Readiness (a) define a more focused work consistent with the beam time requested, (b) prepare simulation and analysis tools timely

Proposal ***A005*** *Beam study topics: Precise COSY OPTICS measurement and modelling*

The goal is to determine the precise linear COSY optics using turn-by-turn BPMs. The proposed approach is to measure the orbit response matrix and compare with simulations. This approach allows interpolation of beam optics between BPMs, a pre-requisite knowledge for EDMs search. Operational tools such as ORM or equivalent (both hardware and software, automated, and control room ready) are almost mandatory for modern storage rings. ORM or similar efforts have not been systematically tried before at COSY.

Turn-by-turn BPMs are strongly recommended. Preferably, all BPMs are turn-by-turn. In case of limiting budget/manpower, an initial phase may consider having a minimum of four t-b-t BPMs (2 for x, 2 for y), at strategically chosen positions.

AC dipole is an existing tool at COSY. The proposal does not elaborate on its usage together with t-b-t BPMs. Additional beam time should be requested if this becomes a planned study in the future.

The ORM technique (or equivalent) opens up future possibilities, e.g. orbit feedback options, precision correction schemes. It is prerequisite toward EDM, but even without EDM, a precision storage ring is the basis to move forward in other future directions.

Rating: Feasibility A Importance A Readiness A with decision on the t-b-t BPMs.

Recommendation ***for all three proposals****:* 3 shifts each (or more if needed); not consecutively.

Proposal ***E001*** *JEDI: Spin Coherence Time Studies with Protons.*

The committee regards the JEDI attempt to demonstrate the feasibility of an EDM measurement in an ion storage ring (here called *Precursor Experiment*) as fundamental for future running of COSY. In the June beam time, a deuteron spin coherence time (SCT) much longer than 1000 s was achieved and announced to the committee during the open session. The CBAC wishes to warmly congratulate the JEDI team for this exciting result! A long SCT is fundamental for the success of EDM experiments.

The present proposal aims at a first experimental study of the SCT of protons which have a 3.1 times larger anomaly G and thus spin tune ν_s at the same Lorentz-γ than deuterons. Simulations comparing protons with deuterons show a much higher sensitivity of ν_s of protons to the beam energy. Three weeks of beam time are requested for the test, including a study of a new type of beam position monitor (BPM), based on a toroidal Rogowsky coil, split into quarters which are separately read out for x-y sensitivity. Apart from a better accuracy, their short length along the beam axis of the order of 10 mm makes them attractive for an improved diagnostic system of COSY.

The present proposal aims to study in detail the correlation between long SCT with sextupole settings for the challenging proton beams. The committee is very much in favor of of the proposed measurement program and has the following comments:

i. To study the effect of cooling on the SCT, the collaboration may consider comparing deuteron SCTs when e cooling or stochastic cooling is on and off.
ii. A possible effect of a Stern-Gerlach effect on vertical polarization should be investigated to make sure that this might not disturb an EDM experiment. The use of the SG-effect for polarizing stored ions has been proposed by Rossmanith and others in the 1980's, but has

never been simulated with modern tools or tested experimentally. The frozen spin configuration, as proposed here, is expected to make the SG-effect to accumulate just as the EDM signal is expected to accumulate.

iii. The SCT is expected to depend sensitively on the three orbital emittances. Can they be measured directly at COSY? With many more and stronger depolarization resonances for protons, this requires detailed knowledge and understanding of closed orbits and non-linear optics of COSY. This is in line with the attempts to add better tools for beam control, simulation and tuning as outlined in some of the accelerator proposals and in E1.

The committee considers the proposed experiments by the JEDI team to be of high quality. Nevertheless, they are presented somehow in piecemeal fashion, which makes it difficult to judge on the schedule and in particular on the readiness of the 'final' *Precursor* experiment. It is strongly recommended that a roadmap plan be considered to align these efforts better with critical path items of a future EDM effort either at COSY or elsewhere. A JEDI time schedule for the 2015-2019 POF-3 period with modern planning tools is important to enable a successful *Precursor* experiment in due time, i.e. 2017-18. It is also recommended that in addition to an experimental effort, a parallel, equally concerted effort be made on theory/simulation front with a wider collaboration. Benchmarking the simulation tools with COSY experiments should be one prime goal of the experimental effort.

Ratings: Feasibility A Importance A Readiness A

Recommendation: 3 weeks (plus MD) in II/2015.

Proposal ***E002*** *JEDI: Towards the EDM Polarimetry*

In the past, the more than 20 years old EDDA detector based on plastic scintillators and scintillating fibers has been employed as standard COSY polarimeter. For the EDM measurements a new detector type with no B or E fields and with modern DAQ is required. This proposal aims at a concept for a radiation-resistant, long-term stable segmented hadron calorimeter for the EDM polarimeter, capable to detect a tiny little vertical polarization component building up with time by the interaction of an EDM with a radial electric field of the storage ring. Beams of protons and deuterons are envisaged for EDM studies, both with Carbon as scattering target because of its high analyzing power A_N and figure of merit FOM. The main focus is on deuteron-Carbon scattering as this has already been used for the study of deuteron Spin Coherence Time (SCT). As detector material, high-Z LYSO crystals have been selected because of their radiation hardness and high light output. One week of beam is requested to study the detector response to deuterons in the range 100 to 270 MeV which will be compared to GEANT simulations. The test of a new trigger-less readout system is included. The setup will be installed at the external BIG KARL beam line.

The presentation showed the status of MC simulations for different configurations, the readiness of the new hardware incl. different LYSO crystals, the DAQ system which is in progress, and plans for the next steps. At the next meeting, the specifications of the detector should be presented more generally and discussed in comparison with other options. The committee fully supports that this important tool is subject to intensive studies. The EDM polarimeter should receive in a still to be detailed JEDI schedule for the period up to the Precursor Experiment a high priority. The committee strongly supports the requested one week of beam time.

Ratings: Feasibility A Importance A Readiness A

Recommendation: 1 week in II/2015.

The experiments which have led to the demonstration of a very long spin coherence time also enabled the observation of a polarization phase-drift wrt. to a fixed spin tune Gγ. For this purpose the scattering events in the EDDA polarimeter have been time-stamped which allowed to reconstruct the additional spin precession of the vector polarized Deuterium beam with respect to the intended rate of ~120kHz. The results indicate a sensitivity which allows to determine changes of the spin tune of a few times 10^{-8} within seconds. The observed phase drifts are of the order of about 1 rad per minute. They consist of a linear and a quadratic term which may be interpreted as a deviation from the intended spin tune and a drift of the actual tune, respectively.

The purpose of this proposal is to use the high accuracy signal of the polarization measurement as a control signal in a feedback loop in order to stabilize the phase motion. Applying changes of the r.f. frequency either for a short period of time or continuously may allow to compensate for the linear and quadratic terms of the drift. The remainder of 2015 is foreseen to test the manipulation of the Rf-system and one week of data taking is requested in 2016.

Such an attempt is clearly feasible given the level of control and cooperation that has been achieved between the accelerator and polarimeter groups. Readiness can be achieved by installing a new high precision oscillator for driving the Rf-cavity by the end of 2015. Demonstrating the capability of stabilizing the spin tune is considered as a very important step towards the "partially frozen spin" precursor experiment at COSY. In consequence, the committee is strongly in favor of this proposal.

The experiment needs a long beam set-up time to prepare the specific beam conditions and the polarimeter. The committee therefore recommends to coordinate this experiment with other ones of the JEDI collaboration or with the so-called machine development time as much as possible.

Ratings: Feasibility A Importance A Readiness A

Recommendation: 1 week in II/2015.

3. Conclusions

Twelve applications for beam time at COSY - in its new role as test ground for FAIR and place for future precision experiments - for the period II/2015 have been presented to CBAC#2, some of them with overlap to I/2016. Three short accelerator proposals (A3-5) were summarized in one presentation by Mei Bai. Overall, the applications and presentations were of high quality and importance, casting light on a future scientific program of the IKP at FAIR and a remodelled COSY lab. In its recommendations, the committee has – similar to the first ones - put emphasis on Feasibility and Importance in this time period, and Readiness for the proposed test. The results of the discussion within the committee are presented in Section 2 and summarized in Table 1. A detailed schedule taking into account the current recommen-dations will be worked out by the Beam Time Coordinator.

A total of thirteen weeks of beam time were recommended by CBAC#2 for scheduling in the second half of 2015 which is of the order of the fourteen 'available' weeks according to the present planning. In its recommendations, the committee has proposed to extend some of the short accelerator tests because of their educational value helping to attract students to accelerator science and technology, fundamental for the future IKP program. Also, 1.5 weeks of beam time have been recommended for an external application, studying radiation hardness of semiconductor circuits. - The beam time recommendations for the period I/2016 are subject of a detailed evaluation of a CBAC session to be scheduled well in advance of the start of the period I/2016 (see below).

COSY in its new role as Test Facility for FAIR key technologies and for the study of EDM of ions will continue to be a facility for internal, but also external users. In particular, tests of detector components will result in frequent setting up and dismantling of sensitive equipment. In order to exploit the limited weeks of beam time efficiently, CBAC regards a good technical support for the external groups as mandatory, as it has been a standard practice at COSY in the past. Here storage space for equipment of frequent visitors and the usual services are important as well. The committee is pleased with the service extended to external users. We are confident that also in future, the IKP finds solution compatible with the additional tasks imposed on the machine and service groups and the needs of visitors.

The CBAC#3 session is planned to take place jointly with the CANU-FFE meeting in the Physikzentrum Bad Honnef on December 17-18th 2015.

Erhard Steffens

CBAC Chair.

4. Addendum:

AGENDA

CBAC#2 2015 Meeting, June 29 and 30, 2015

June 29th, 2015

09:00 – 09:30	**Closed session** (IKP, room 311)	
	Hans Ströher	Welcome, issues t.b.d., …
	Erhard Steffens (chair)	Organization, committee work, …
	Open session (IKP, room 312)	
09:30 – 09:45	Hans Ströher	Welcome
09:45 – 10:00	Ralf Gebel	*Status / Achievements of COSY*
	Proposals are scheduled for 15' presentation + 10' discussion	
10:00 – 10:25	Johann Heuser	CBM-Detector Tests
10:25 – 10:50	Huagen Xu	KOALA Experiment
10:50 - 11:15	**Coffee**	
11:15 – 11:40	Hans-Georg Zaunick	MVD-Detector Tests
11:40 – 12:05	Peter Wintz	STT-Detector Tests
12:05 – 12:30	St. Höffgen	INT-Measurements
12:30 – 13:45	**Lunch**	
13:45 – 14:10	Andreas Lehrach	JEDI Spin coherence time stud.with protons
14:10 – 14:35	Irakli Keshelashvili	JEDI Towards the EDM Polarimetry
14:35 – 15:00	Ed Stephenson	JEDI deut. spin tune with active feedback
15:00 – 15:25	Hans Stockhorst	Accel.: Stochastic cooling for HESR
15:25 – 15:55	Vsevolod Kamerdzhiev	Accel.: High energy electron cooling & BNL proposal (Beam dynamic studies)
15:55 – 16:25	**Coffee**	
16:25 – 16:55	Mei Bai	Machine studies @COSY
17:00 – 18:45	**CBAC closed session** (IKP, room 311)	
19:00	**Dinner** (FZ-Seekasino) also for speakers	

June 30th, 2015

09:30 – 12:45 **CBAC closed session** (IKP, room 311)
representatives of the experiments should be available for additional information or questions

12:45 – 14:00 **Lunch (IKP, room 310) / End of meeting**

COSY Proposals and Beam-Time Requests for CBAC #2 (June 29/30, 2015)

No.	Title of experiment	Spokesperson	Installation	p_{Beam} [GeV/c]	Intensity [1/s] (ext.) [stored](int.)	beam time (weeks)	Earliest date of installation	Remarks/ Recommended time
D001.1	MVD	D.Calvo	JESSICA	0.6-2.9	$> 10^7$ cm^{-2} s^{-1} protons	1	Feb 2016	MVD pixel, strips, electronics, irradiation, time-stamp sync.
D002.1	STT	P.Wintz	COSY-TOF	0.6, 0.8, 2.95	Up to 10^7 cm^{-2} s^{-1} deuterons	1	Nov 2015	Opti. Readout elec., new ASIC chip, new FADC board, 700 channels,...
D004.1	CBM	J.Heuser	JESSICA / TOF	2.7	$> 10^8$ cm^{-2} s^{-1} protons	1 1	Aug 2015 Feb 2016	Test of electro. comp., and CBM prototype det. @high load, T0, MVD, STS, MUCH/GEM, TRD, TOF,...
D005.1	KOALA.	Huagen Xu	ANKE?	3.2	$> 10^{10}$ cm^{-2} s^{-1} protons	2	Oct 2015	commission the recoil detector setup for the Koala experiment at HESR
D006	INT	St. Höffgen	JESSICA	0.5-3.4	10^{10} cm^{-2} s^{-1} protons	27 shifts 3 camp	Jul.2015	Test of microelectronics
A001.1	Acce. stoch. cool	H. Stockhorst	COSYring	2.425	$> 10^8$ cm^{-2} s^{-1} protons	1	?	HESR stoch. cooling,..
A002.1	Acce. elec. cool	V. Kamerdzhiev	COSYring	2.425-3.7	stored 10^{10} protons	2	installed	Comb. Performance of e- and stoch. cooling,..
A003	Beam dyn.study	V. Kamerdzhiev, Blaskiewicz	COSYring	below 1GeV/c	stored 10^{10} protons	3 shifts 3 camp	?	3 shifts in total-not consectively
A004	Non-linear beam dyn.	G.Franchetti, F.Schmidt	COSYring	?	stored 10^{10} protons	3 shifts 3 camp	?	3 shifts in total-not consectively
A005	COSY optics	Chr. Böhme	COSYring	0.970	deuterons	3 shifts 3 camp	?	3 shifts in total-not consectively
					Total			

COSY Proposals and Beam-Time Requests for CBAC #2 (June 29/30, 2015)

No.	Title of experiment	Spokesperson	Installation	p_{Beam} [GeV/c]	Intensity [1/s] (ext.) [stored](int.)	beam time (weeks)	Earliest date of installation	Remarks/ Recommended time
E001.1	JEDI-SCT	A.Lehrach M.Rosenthal	COSYring	0.1-0.2	stored 10^{10} pol.protons	3	Nov 2015	Spin coh. Time studies
E002	JEDI-Pol	I.Keshelashvili B. Lorentz	Big Karl	0.1-0.27	10^{7} cm^{-2} s^{-1} deuterons	1	Nov.2015	EDM Polarimetry
E003	JEDI-feedback	V.Hejny E.Stephenson	COSYring	0.97	stored 10^{10} pol.deuterons	1	Nov 2015	Spin tune with active feedback
					Total	**~16**		