Beam request for COSY experiment # 125.2
"The Polarised Charge–Exchange Reaction $\vec{d}p \to (pp)n$"

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for the ANKE Collaboration.

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1 Introduction

At the current PAC session #30, the ANKE collaboration is submitting a physics proposal on the polarised COSY program: *Spin Physics from COSY to FAIR* [1]. Some material of this proposal (#152) had been prepared for submission to the POF evaluation committee and were favourably received [2]. A key feature of the experiments planned at ANKE is the use of polarised beams and polarised targets which allow performing double polarisation experiments. The focus is on the study of three–body final states with the aim of extracting basic spin–dependent two–body scattering information.

One of the key experiment is "The Polarised Charge–Exchange Reaction $\vec{d}p \to (pp)n$" (#125). The physics addressed in this measurement is the $p-n$ scattering and charge exchange reaction. The aim is to provide an accurate data base for effective field theory approaches to the low–energy nucleon–nucleon interaction, which is being developed by the Jülich theory group and which bears the potential for establishing a realistic nuclear interaction based on Quantum Chromo Dynamics.

Experiment #125.1 is the first part of this program. The achievements of the research with polarised deuteron beam carried out during the first test measurement (3 days in Nov' 03) and 1 week of beam time in Feb' 05 are described in the new proposal #152 (see chapter 4 and 5), which is submitted to the PAC. More recent information about the status of the data analysis will be given in the oral presentation by Dr. Andro Kacharava during the PAC meeting.

2 Beam Times Given to the Experiment

During the last COSY–PAC sessions (#26 and #28), the following decisions regarding the ANKE beam times concerning experiment # 125 have been made:

Session #26, Proposal + Beam request 125: " ... Collaboration gets a **few days** of testing during machine development of polarised deuterons". This test experiment was carried out during Nov' 23–25 2003. Based on data, a paper on "Tensor analysing powers in $(\mathrm{d}, 2\mathrm{p})$ and $(\mathrm{d}, \mathrm{np})$ reactions" is currently prepared for submission to Phys. ReV. C.

Session #28, Beam request 125.1: " ... Allocation of **TWO weeks** of beam time for the proposed measurements plus **one week** of beam time dedicated to target-cell studies". From this granted beam time **ONE week** was taken for "Polarised Charge–Exchange Reaction" measurements and **one week** was used for cell tests during Feb' 05. The data analysis is in progress.

3 Beam Time Request

At the last PAC session (#29), regarding the ANKE beam time for the proposal #104.2 *'Investigation of a possible exotic state in the* ΦN *system'*, **three weeks** of beam time were granted, to be scheduled in the coming beam–time period, *i.e.* winter/spring 2006.

Due to the high importance of a narrow state in the ΦN system, in proposal #104.2 the ANKE collaboration – in accordance with the management of the IKP – decided to internally re–arrange the three approved beam times. The measurements for experiment #104.2 have been scheduled and were successfully carried out in March 2005.

As a consequence, with this beam request, the ANKE collaboration asks the beam–time coordinator to schedule our **second allocated week** for experiment #125.1 in the next beam period. It should be noted that the requested beam–time is intended to provide the data necessary to complete the PhD work of David Chiladze.

References

[1] A. Kacharava, F. Rathmann, and C. Wilkin for the ANKE Collaboration, Proposal #152: *Spin Physics from COSY to FAIR*; available from `http://www.fz-juelich.de/ikp/anke/.`

[2] P. Paul *et al.*, *Evaluation of COSY and FZJ contributions to FAIR*, POF review document available from `http://www.fz-juelich.de/ikp/documents`.