MAMBO

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1 Introduction

MAMBO groups together two complementary INFN activities in Germany both aimed at studying the excited spectrum of the nucleon: the experimental program with the MAMI-C microtron in Mainz and the BGO-OD experiment at Bonn-ELSA. LNF are involved in the last activitiy.

2 BGOOD experiment

The BGOOD esperiment is performed in collaboration between INFN sections of Roma2, LNF, Messina, Pavia, ISS-Roma1 and Torino, the University of Bonn, Physikalisches Institut, ELSA department, the University of Bonn, Helmholtz Institut für Strahlen- und Kernphysik, the University of Edinburgh, the National Science Center Kharkov Institute of Physics and Technology, the University of Moscow, Russia, the Petersburg Nuclear Physics Institute (PNPI), Gatchina and the University of Basel. More that 70 physicists participate to this experimental program foreseen to last until 2020 with possible extention. Idaho State University has joined the collaboration in 2014.

The INFN instrumental contribution consist in the *Rugby Ball* calorimeter and associated detectors previously used at GRAAL, the target system, the cylindrical tracking chambers and the MRPC detector. In the collaboration managment, LNF expresses the co-spokesperson and one of the experiments to be performed as advised by the joint MAMI-ELSA PAC is leaded by LNF as well (η' photoproduction near threshold).

3 Activity in 2016

During 2016 only short beam times were delivered to BGOOD. These were used to optimize beam intensity, on-line polarimetry, detector stability and robustness. The detector was fully assembled and is now in its final configuration. The photon beam was optimised and the tagging system was complemented with tha ARGUS fibre detector that allows for a precise measurement ($\Delta E_\gamma \sim 5MeV$) of the photon spectrum in the region of the polarised peak.

The experiment is now routinely capable of producing a photon beam of intensity $3 \cdot 10^7 s^{-1}$ very close to the design value of $5 \cdot 10^7 s^{-1}$. The beam can be polarised *via* the technique of the coherent *Bremsstrahlung*. around 1.5 GeV, the region of major interest, a degree of linear polarisation ~ 0.4 was obtained. The alignement of the diamond crystal with the electron beam is performed with the *Stonehenge* technique (Fig. 1), and the degree of polarization is continously monitored.

The BGO *Rugby Ball* calorimeter, now equipped with sampling ADC's, was calibrated by using 22Na sources and the calibration obtained at low energy was demonstrated to be usable in the GeV range. Moreover, the possibility od detecting particles with different arrival times allows to use the calorimeter as a K^+ detector by measuring the decay products of the stopped kaon. The barrel detector was calibrated as well and the necessary PID in the central region was obtained.

The MRPC and MWPC detectors were installed at the end of the year and their commissioning was started. The MRPC detector, developped by INFN with main contribution from Roma2

was tested at the BTF in LNF. The results obtained are as expected, and a good timing resolution is obtained already with a two-stakcs detector (see Fig. 2).

4 Planned activity in 2017

One data taking period of 20 days is scheduled in 2017 before end of May. The polarization peak position will be the optimal for the measurement of the beam asymmetry in η' photoproduction near the threshold. Later MRPC and MWPC detectors will be installed and commissioned.

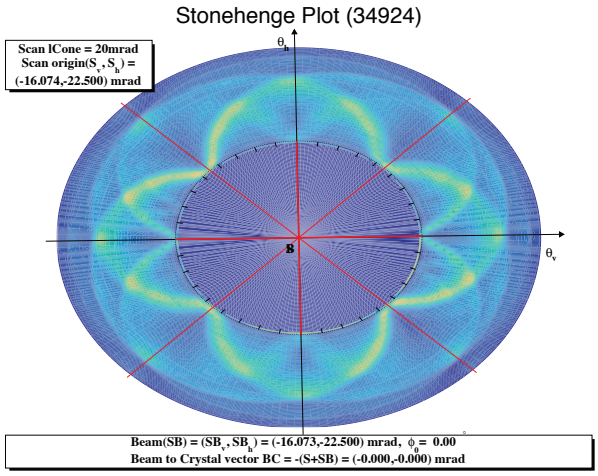

Figure 1: *The Stonhenge plot for a perfectly aligned crystal.*

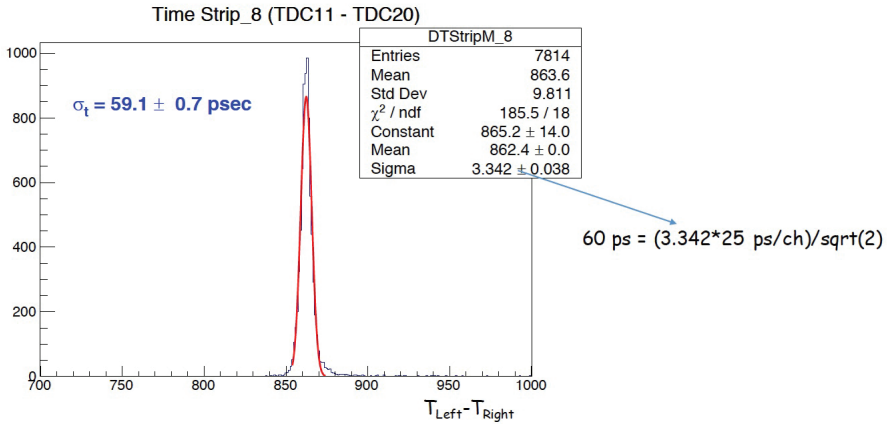

Figure 2: *Timing resolution for a two-stacks detector.*