

Abstract Submitted  
for the DNP08 Meeting of  
The American Physical Society

**Developing an Efficient Read-Out System for the A2 Pair Spectrometer at Mainz**<sup>1</sup> AMAL AL KATRIB, WILLIAM BRISCOE, George Washington University, MAINZ MICROTON A2 COLLABORATION — The scientific program at the Mainz Microton (MAMI) is based on polarized electron and photon beams from the MAMI A-B-C accelerator complex. The scientific program at the Mainz Microton (MAMI) is based on polarized electron and photon beams from the MAMI A-B-C accelerator complex with energies up to 1.5GeV. In order to deal with the energy increase, the photon tagger system has been extended and refurbished by the Glasgow University Nuclear Physics Group. It is now available for real photon experiments in the A2 hall. For experiments with real photons in the A2 hall, the Crystal Ball detector is being used regularly together with an inner detector for tracking and a forward crystal calorimeter (TAPS) for 4pi gamma coverage. A new data acquisition system with high-rate performance is in operation. Experiments are currently running using a liquid hydrogen/deuterium target. The Pair Spectrometer in the A2 hall is not providing timing information efficiently due to the various disadvantages of using photomultiplier tubes in high magnetic fields. This poster will include the current status of the experimental equipment in Mainz and the role of student involvement in the program at MAMI. Student will discuss the project given in hand, which is replacing photomultipliers in the Pair Spectrometer with avalanche photodiodes that are not affected by the 1 Tesla magnetic field. The output of 2 detectors, a large area avalanche photodiode and a multi-pixel photon counter, is observed and compared for better rise time and detection of electron-positron pair as the photon beam hits matter. For testing purposes, the photodiode is attached to a scintillator and is connected to a pre-amplifier (ORTEC 142A) followed by a timing amplifier (ORTEC 474) and then a pulse shape discriminator (model 2160A).

<sup>1</sup>Supported in part by the US National Science Foundation Office of International Science and Engineering, US Department of Energy, and George Washington University University Research Enhancement Fund.

Date submitted: 04 Sep 2008

Electronic form version 1.4