Short Status of POLAND (former PGproto) 
and COSY 2013

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Agenda

- COSY 2013
- Renaming of project name
- Status of project
- Next steps
Analysis of COSY Beam Data

Calculation of Beam Profiles for all DUT

Given:

- Detailed beam profile (via SEM Grid and PG Proto2)
- Number of particles (via Ionization Chamber and QFW readout)
- Beam profile at different locations (via GAFCHROMIC)

Calculation of:

- Angle of beam spread (via GAFCHROMIC)
  - X: 2.94 mrad (x0 = -2.14 m from COSY exit-window)
  - Y: 1.93 mrad (y0 = -2.86 m from COSY exit-window)
- Protons / cm² as well as Protons / cm² / s for every spill event and for every DUT
Finally 2 days with beam on target:

- $\approx 3.88 \cdot 10^{12}$ protons delivered from COSY
- All diagnostic devices worked
- GET4, PADI and QFW were located directly in beam
  - QFW: $2.61 \cdot 10^{12}$ protons/cm² or TID: 752 Gy(SiO$_2$)
  - PADI: $2.31 \cdot 10^{12}$ protons/cm² or TID: 665 Gy(SiO$_2$)
  - GET4: $2.23 \cdot 10^{12}$ protons/cm² or TID: 642 Gy(SiO$_2$)
- overall: 8 SEUs have been detected $\Rightarrow \sigma = 3.59 \cdot 10^{-12}$ cm² / event
  (has still to be cross-checked via Holger Flemming)

$\Rightarrow$ worked without any problems
Results from CBM COSY 2013 (II)

- Power regulator LTC 3610 survived without any obvious problems ($2.49 \cdot 10^{12}$ protons/cm$^2$)
- Power regulator LTC 3605 “died” after nearly half of beam time ($0.77 \cdot 10^{12}$ protons/cm$^2$)
  ➔ still looking for reason
- Beam profile much better than in 2012
- Measured first beam data with new PG-Prototype system
- Commercial µ-Controllers stopped program after beam start
Renaming of Project name

The preliminary / internal project name “PG Proto” should now change to a “operating” project name.

The results of the survey revealed the name "POLAND".

POLAND: Profile Acquisition digitizer
Status of POLAND / PG Proto 2
Status of POLAND / PG Proto 2

Things to do in the next weeks/months:

• Test of the next 11 boards (motherboards and FPGA boards)
• 80 QFW PiggyUp PCBs will be assembled
  – 80 boards with 160 QFWs are glued (= die bonded)
  – 8 boards are bonded and tested
  – Beginning in November: bonding of remaining boards
  – Glob top chip protection of QFW ASICs
• 19” Front and back panel assembly
  – LED holes
  – Connectors
  – Ventilation slots
• Assembly of 19” cases
FESA Implementation

- Slow control programming of POLAND system as well as online monitoring is ready to use
- Connection PEXOR to Logic Unit was tested already before with a similar logic unit (EXPLODER)

Presented already at 9th FAIR MAC Meeting - 22nd May 2013

- Improvement of FESA implementation for Saclay test

Control and instruction screen for front-end electronics (GUI)
POLAND – Next Steps

Things to do in the next nearly months: Test of POLAND system

- Lab characterization of new system:
  - Offset temperature drift
  - Software (FPGA) tests of slow control

- With available detectors and beam:
  - SEM-Grid of the ion sources group
  - MWPC at HIT (Heidelberg)

Important milestone in 2013

Final test for: LEBT Saclay (Test for p-LINAC) (begin of 2014)
Additional slides from last talk...
Passive Beam Diagnostic (II)

Further examples of film radiation:

Film of beam exit window

Film at the end of our experimental setup (3.66m after exit window film)
Beam Diagnostic (I)

Ionizing Chamber
(from GSI Detector-Lab Department)
- Biased with 1kV
- Readout with QFW ASIC

Typical COSY extraction beam profile in 2013
- 7s beam extraction
- 15s break (for refill synchrotron)
Beam Diagnostic (II)

Ionizing Chamber – Number of Protons per Event Number

Beam interruption (safety reason or cave access)
Beam Diagnostic (III) – PGproto2

SEM-Grid – x-Profile Overview

Top view

20 s
Beam Diagnostic (IV) – PGproto2

SEM-Grid – x-Profile Overview

3D view from front
Beam Diagnostic (V) – PGproto2

SEM-Grid – x-Profile Overview

3D view from side
SEM-Grid – x-Profile Overview

3D view from back
SEM-Grid – x-Profile Overview

broken wire in connector of cable to SEM-grid